AD-A154 456 OSAGE RIVER BASIN OSAGE RIVER MISSOURI HARRY S TRUMMAN DAM & RESERVOIR MU..(U) CORPS OF ENGINEERS KANSAS CITY MO KANSAS CITY DISTRICT R F GRIFFITH ET AL. 1984 1/4

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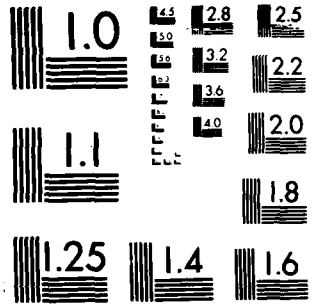

MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS 1963-A

Multiple-Purpose Project
Osage River Basin
Osage River
Missouri

(6)

Harry S. Truman Dam & Reservoir

Operation and Maintenance Manual

Appendix VII
Volume Two

Construction Foundation Report

US Army Corps of Engineers
Kansas City District

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

REPORT DOCUMENTATION PAGE

READ INSTRUCTIONS BEFORE COMPLETING FORM

1. REPORT NUMBER: APPENDIX VIII TO THE HARRY S. TRUMAN DAM & RESERVOIR O&M MANUAL

2. GOVT ACCESSION NO.

3. RECIPIENT'S CATALOG NUMBER

4. TITLE (and Subtitle): MULTIPLE-PURPOSE PROJECT
OSAGE RIVER BASIN
OSAGE RIVER, MISSOURI
HARRY S. TRUMAN DAM & RESERVOIR
OPERATION AND MAINTENANCE MANUAL
APPENDIX VIII, VOLUMES ONE AND TWO
CONSTRUCTION FOUNDATION REPORT

5. TYPE OF REPORT & PERIOD COVERED: Construction Foundation Report from September 1966 November 1979

6. PERFORMING ORG. REPORT NUMBER

7. AUTHOR(s): Mr. Richard F. Griffith-Resident Engineer
Mr. Walter E. Donan - " "
Mr. D. J. Bell - " "
Mr. Billy J. Cheatham - " "
See No. 7 on back for remaining authors

8. CONTRACT OR GRANT NUMBER(s): Cost Key BF3815134500000

9. PERFORMING ORGANIZATION NAME AND ADDRESS:
Geology Section (MRDED-FG)
Foundations and Materials Branch (MRKED-F)
Kansas City District Corps of Engineers
601 E. 12th Street
Kansas City, MO 64106-2896

10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS: PB-2b and ER 1110-1-1801, Change 2, dated 1 April 1983

11. CONTROLLING OFFICE NAME AND ADDRESS:
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Design Branch (MRKED-D)
Kansas City District, Corps of Engineers
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Kansas City, MO 64106-2896

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Distribution in Accordance with
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This report to be complete, requires both Volume One and Volume Two

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18. SUPPLEMENTARY NOTES

19. KEY WORDS (Continue on reverse side if necessary and identify by block number)

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20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

The purpose of this report is to provide a record of foundation conditions encountered during construction and methods used to adapt to these conditions during construction. This information is a part of the permanent collection of project engineering data required by Appendix A to ER 1110-1-1801, dated Dec 81. This report deals with construction of the main embankment, the Sterett Creek Dike and the Spillway-Powerhouse.

DD FORM 1 JAN 73 1473 EDITION OF 1 NOV 65 IS OBSOLETE

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7. Authors (Cont.)

Mr. John W. Doty - Project Geologist
Mr. Wallace E. Penn - " "
Mr. Victor Anderson - Editing Geologist

OPERATION AND MAINTENANCE MANUAL
HARRY S. TRUMAN DAM AND RESERVOIR
OSAGE RIVER, MISSOURI

APPENDIX VII
CONSTRUCTION FOUNDATION REPORT
VOLUME II

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TRUMAN DAM AND RESERVOIR
:AGE RIVER, MISSOURI

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VOLUME II

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OPERATION AND MAINTENANCE MANUAL
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RUMAN DAM AND RESERVOIR
E RIVER, MISSOURI

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VOLUME II

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FILE NO. 0-12-9299
PLATE NO. B

OPERATION AND MAINTENANCE MANUAL
HARRY S. TRUMAN DAM AND RESERVOIR
OSAGE RIVER, MISSOURI

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VOLUME II

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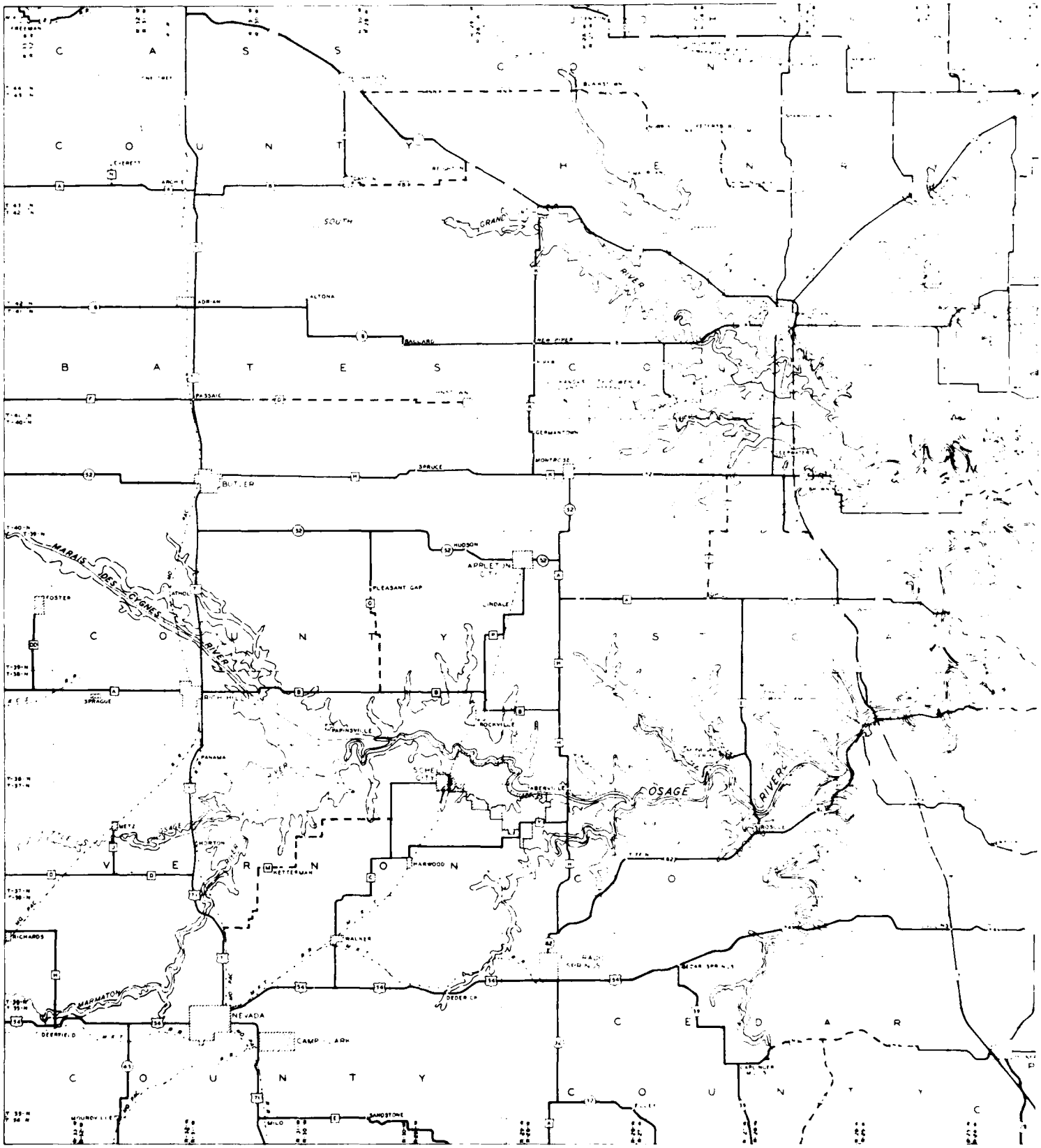
FILE NO. 0-12-9300

PLATE NO. C

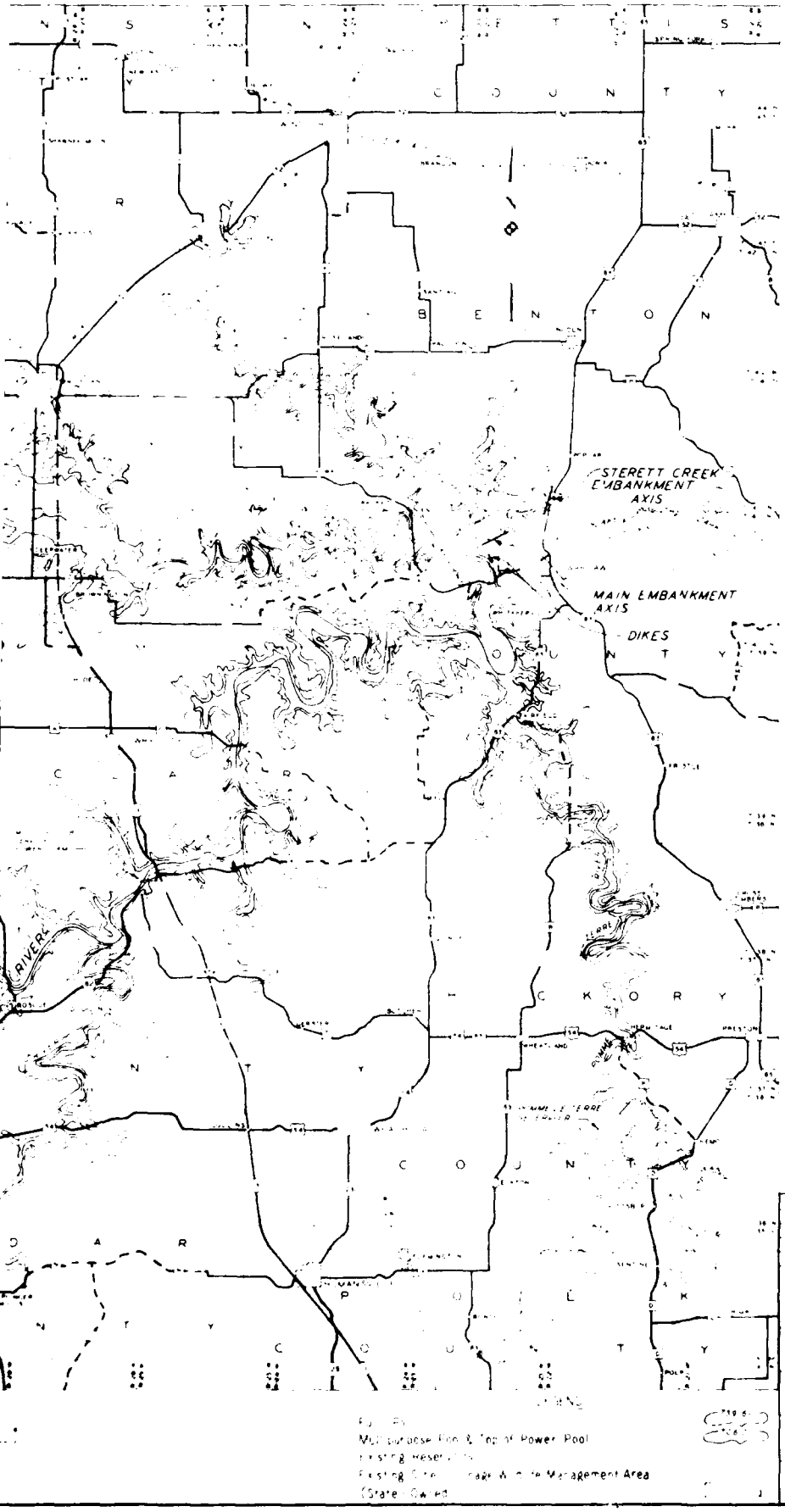
STAGE I CONSTRUCTION

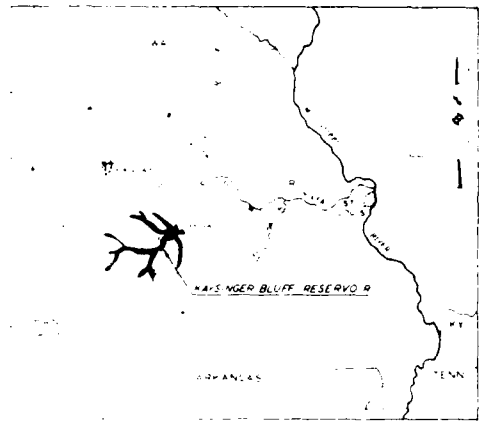
RUCTION

STAGE I CONSTRUCTION


CASS COUNTY
HENRY COUNTY
BATES COUNTY
VERNON COUNTY
CEDAR COUNTY
SOUTH GRAND RIVER
ADRIAN
ALTONA
BALLARD
PASSAIC
GERMANTOWN
MONTROSE
SPRUCE
BUTLER
HUDSON
APPLETON CITY
PLEASANT GAP
LINDALE
MARAIS DES CYGNES RIVER
FOSTER
SPRAGUE
ROCKVILLE
PANAMA
OSAGE RIVER
HARWOOD
WALKER
RICHARDS
MARMATON
NEVADA
DEERFIELD
CAMP ARK
MILO
SANDSTONE
DEDER CR
CEDAR SPRINGS

VICINITY





LOCATION

SOURCE OF RIPRAP AND BEDDING FOR THIS CONTRACT
GOVERNMENT QUARRY 3 N E QUARTER, SECTION 13, T-40-N, R-23-W, BENTON COUNTY, MO BURLINGTON LIMESTONE

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Revisions
Descriptions | Date | Approved

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

US Army Corps of Engineers

CONSTRUCTION FOUNDATION REPORT

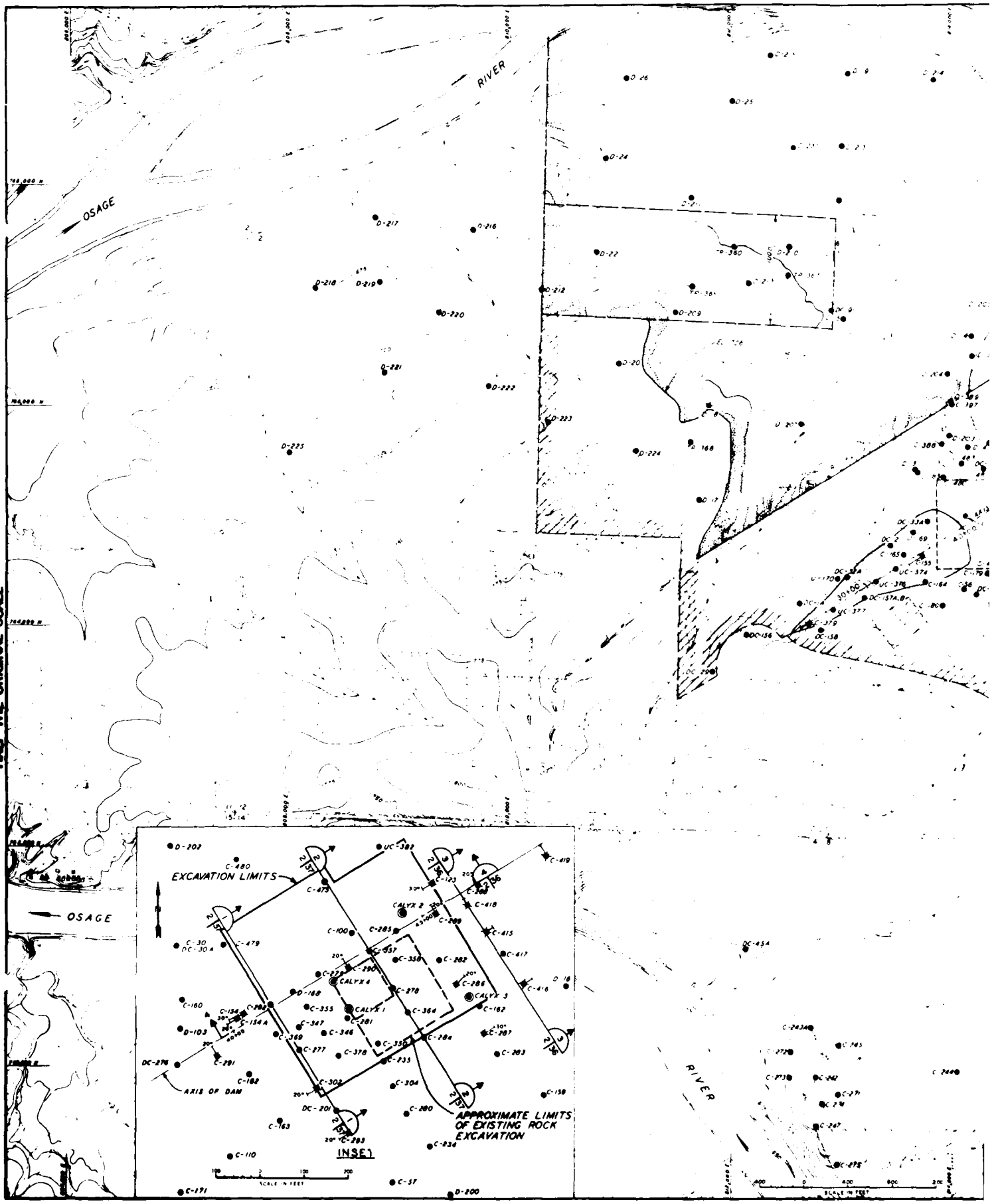
LOCATION AND VICINITY

MARCH 1985

Sheet Number

No. 0-12-9131

PLATE NO. 1



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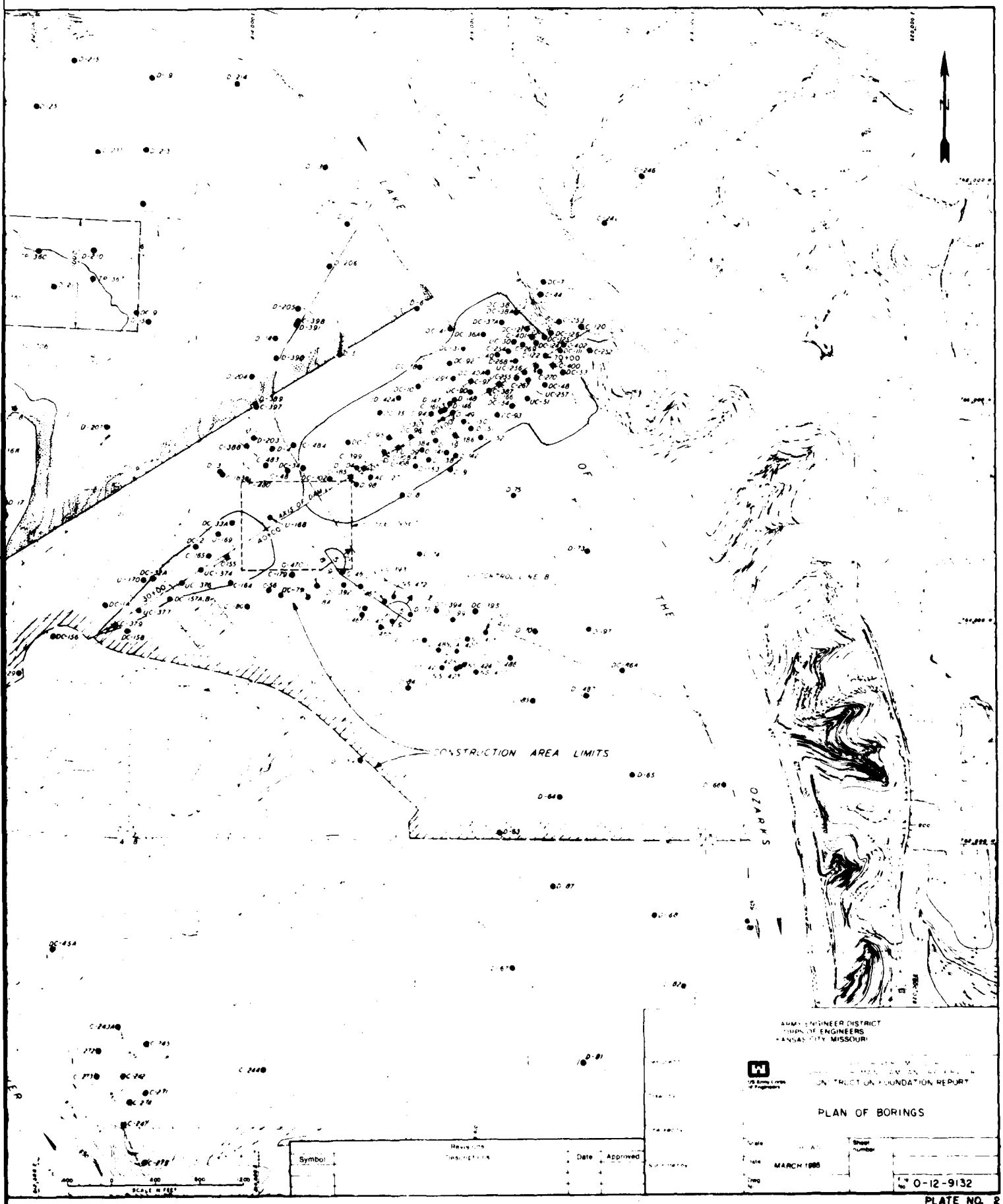
CONSTRUCTION AREA LIMITS
AXIS OF DAM
CONTROL LINE B
LAKE
OF
THE
OZARKS
SCALE IN FEET
Symbol
Revisions
Date
Approved
ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI
US Army Corps of Engineers
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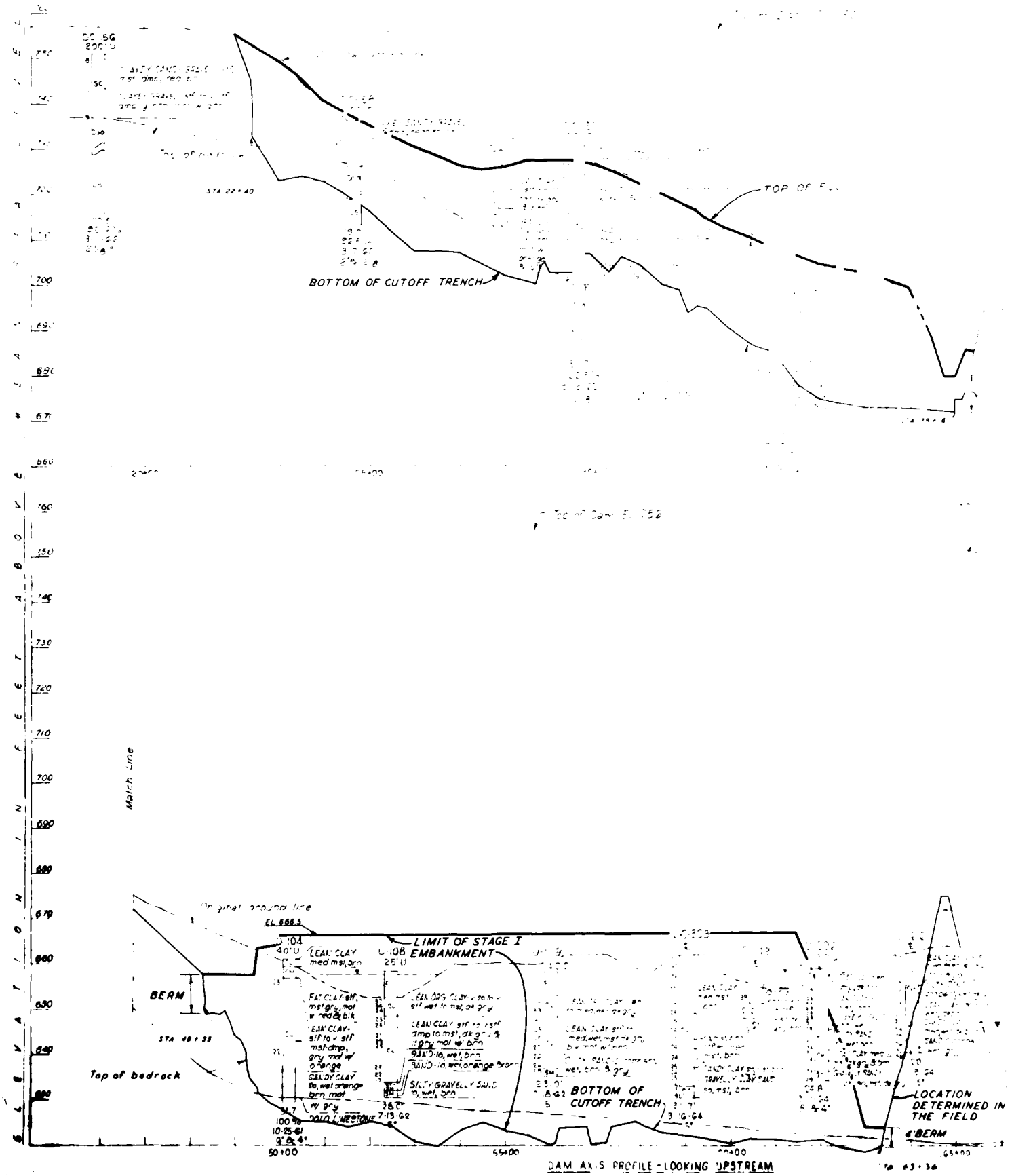
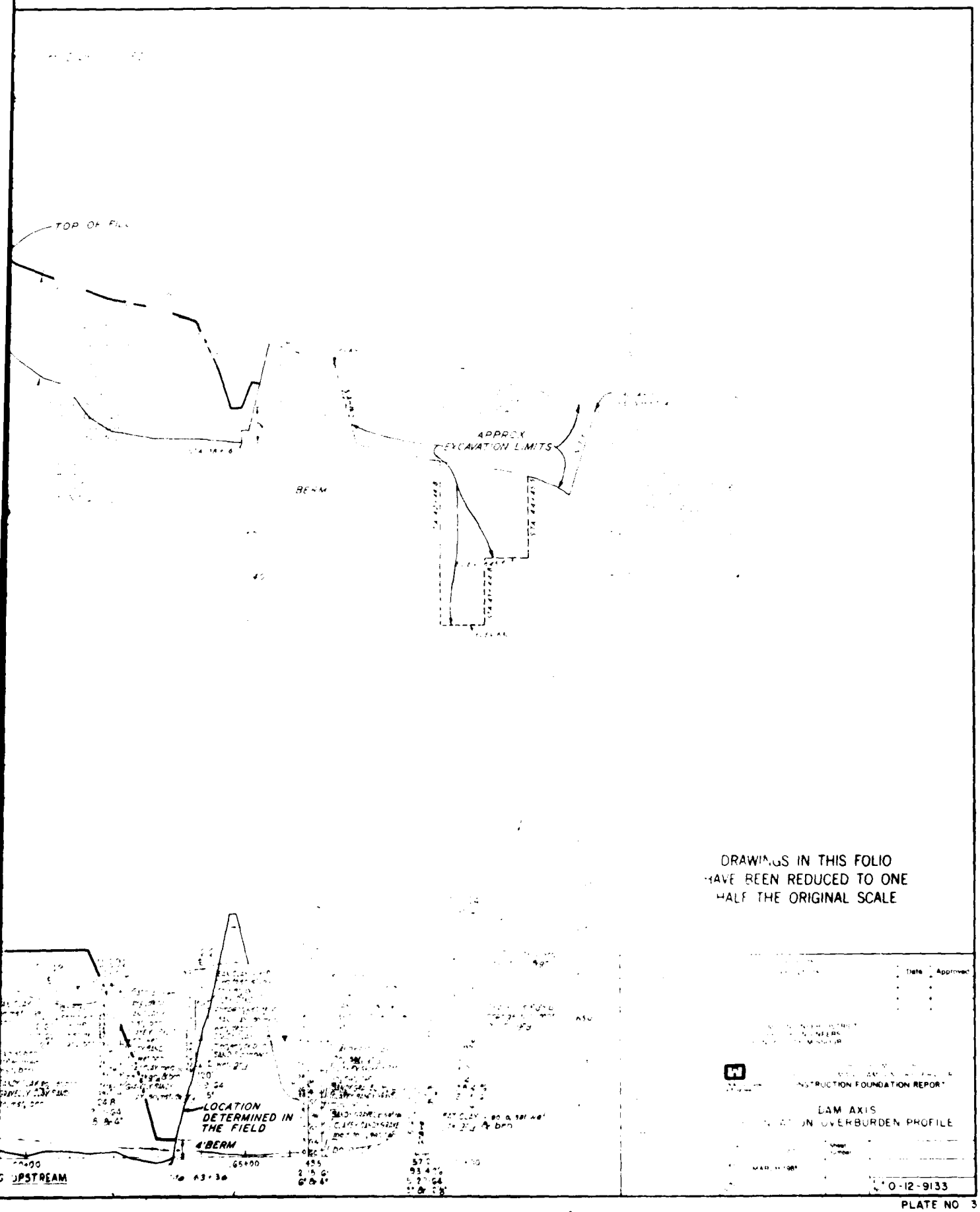
PLAN OF BORINGS
MARCH 1985
Sheet number
No. 0-12-9132

PLATE NO. 2


ELEVATION IN FEET ABOVE MEAN SEA LEVEL
STA 22+40
TOP OF
BOTTOM OF CUTOFF TRENCH
Match Line
Original ground line
EL 666.5
LIMIT OF STAGE I EMBANKMENT
LEAN CLAY med ms, brn
BERM
STA 48+35
Top of bedrock
BOTTOM OF CUTOFF TRENCH
LOCATION DETERMINED IN THE FIELD
4' BERM
50+00
55+00
60+00
65+00
DAM AXIS PROFILE - LOOKING UPSTREAM


TOP OF FILL
APPROX
EXCAVATION LIMITS
BERM
LOCATION
DETERMINED IN
THE FIELD
4' BERM
UPSTREAM
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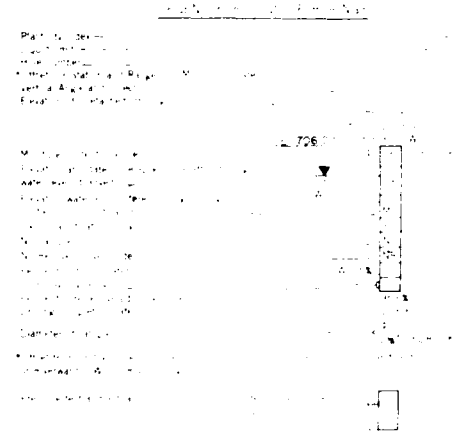
Approved
INSTRUCTION FOUNDATION REPORT
DAM AXIS
ON OVERBURDEN PROFILE
0-12-9133

PLATE NO 3

GENERALIZED GEOLOGIC COLUMN HARRY S. TRUMAN DAM



GW

GM

mixtures

SW

SP

SM

SC

Very soft

Soft

Medium

Stiff

Very stiff

Hard

Very loose

Loose

Medium dense

Dense

Very dense

MN HARRY S TRUMAN DAM

GENERAL GEOLOGY OF MN HARRY S TRUMAN DAM

[illegible] are present throughout [illegible] formation, were not included

[illegible] noted on boring logs, is defined [illegible] chert and dolomite limestone fragments

[illegible] where noted of boring logs, [illegible] fragments of chert and dolomite limestone

Revisions		
Descriptions	Date	Approved

ARMY ENGINEER DISTRICT
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KANSAS CITY MISSOURI

[illegible] MISSOURI RIVER BASIN

CONSTRUCTION FOUNDATION REPORT

GEOLOGIC COLUMN AND LEGEND

MARCH 1985

Sheet number

File No. 0-12-9134

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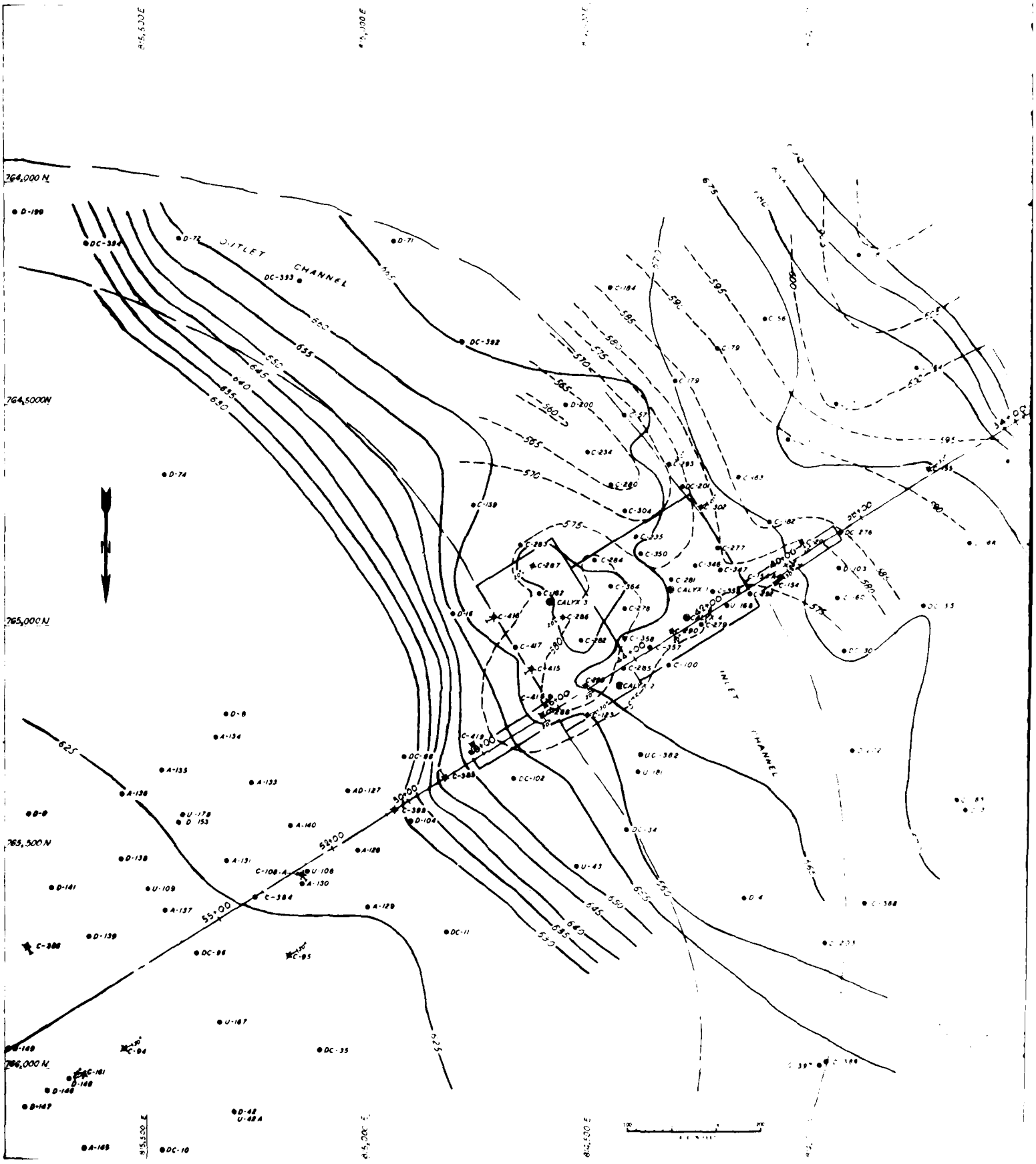
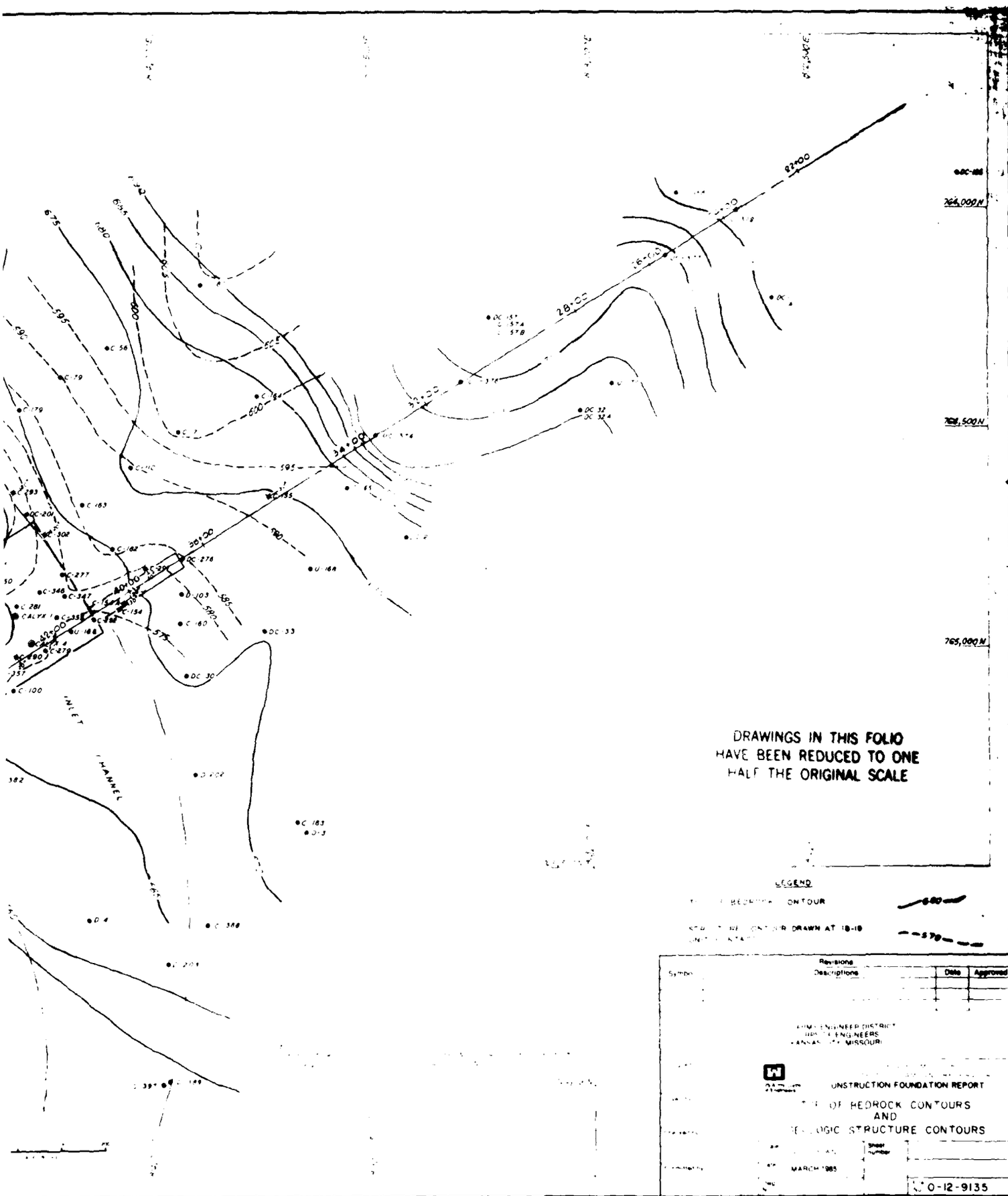
PLATE NO. 4

CORPS OF ENGINEERS




82+00
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26+00
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12+00
10+00
8+00
6+00
4+00
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0+00
768,000N
766,500N
765,000N
675
650
625
600
595
580
575
INLET
CHANNEL
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CONSTRUCTION FOUNDATION REPORT
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AND
GEOLOGIC STRUCTURE CONTOURS
MARCH 1985
Sheet number
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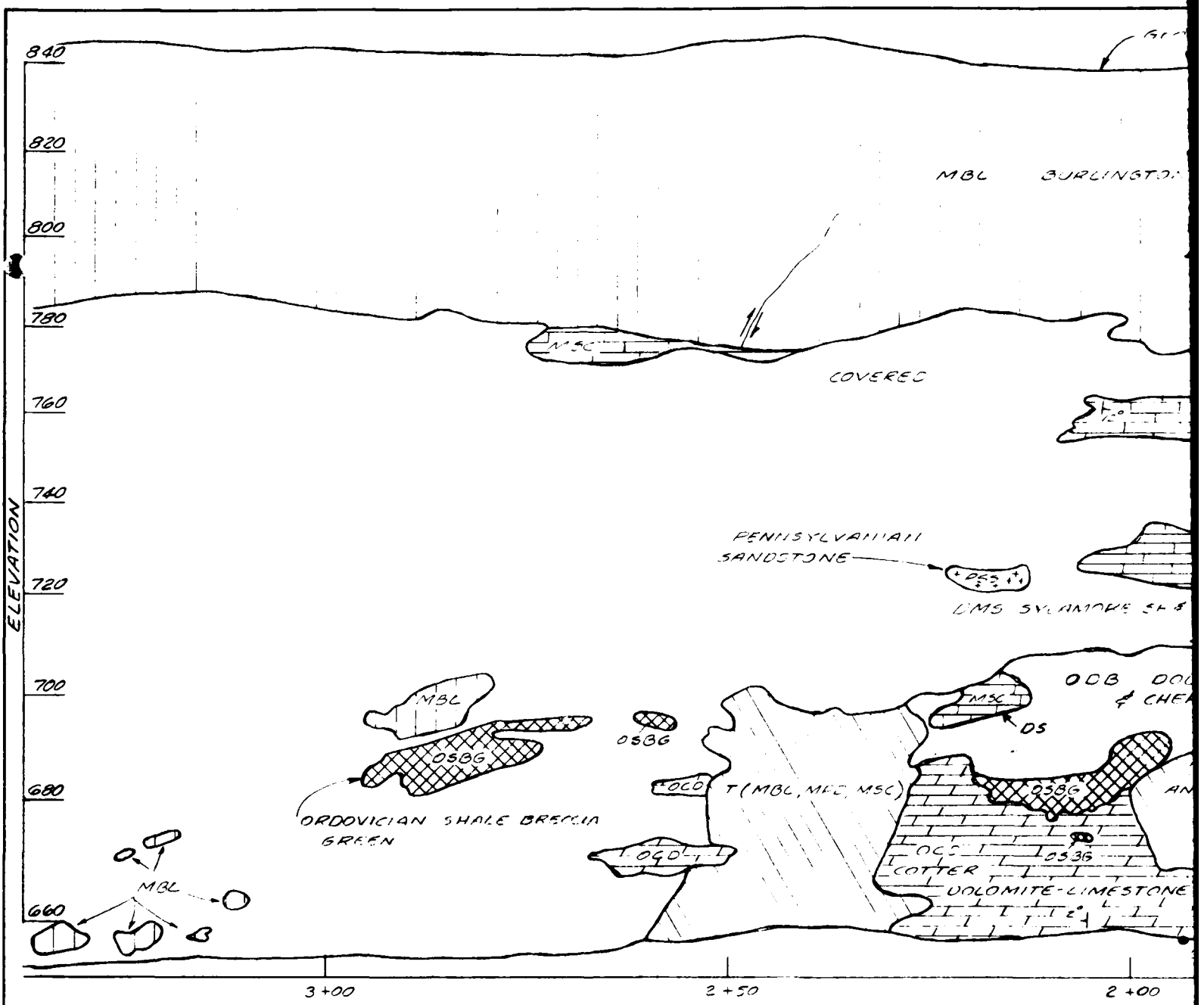
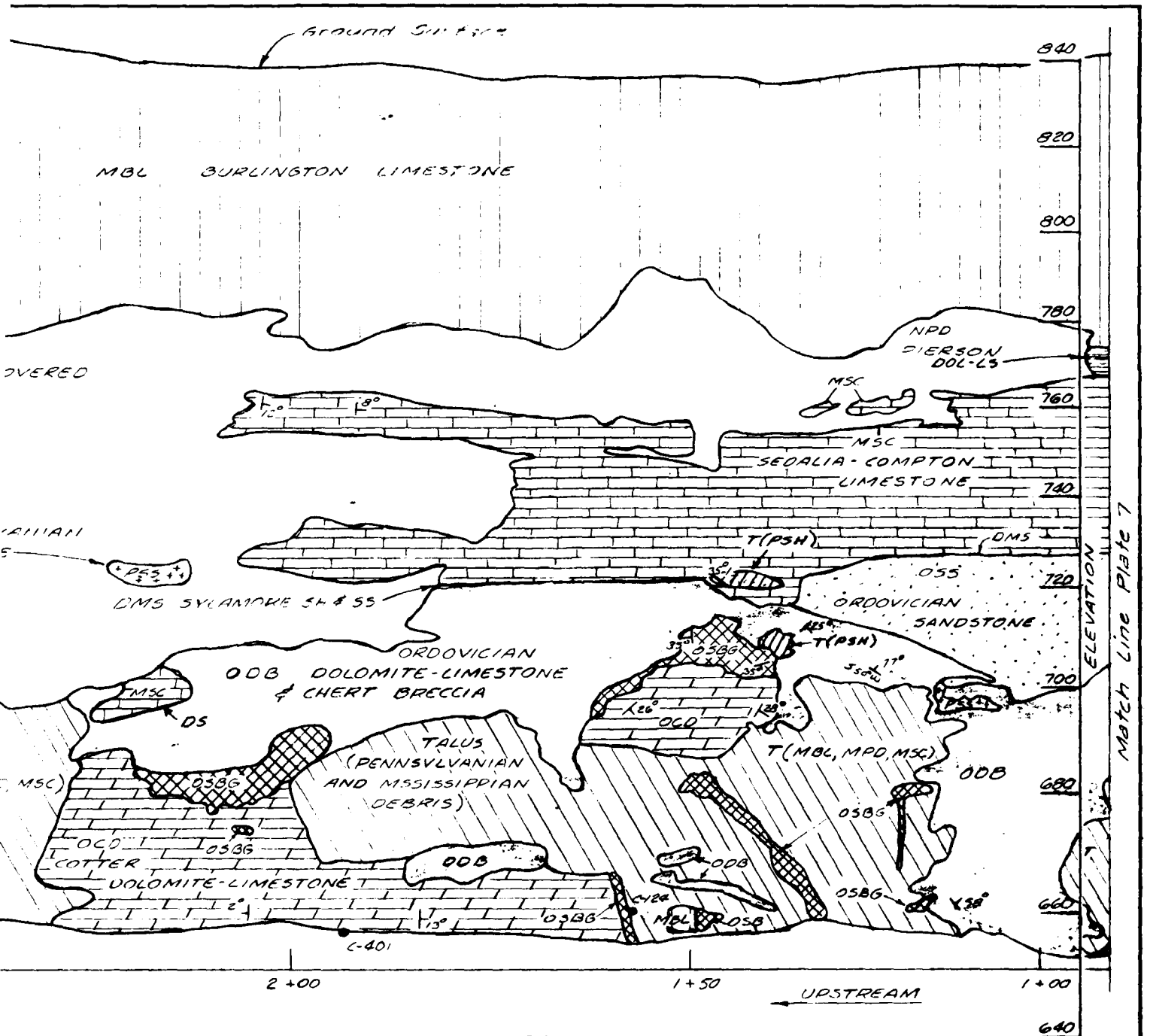
PLATE NO 5



LEGEND

QUATERNARY		T(MBL) Talus (Rock Unit)
UNCONFORMITY		
PENNSYLVANIAN		PSH Penn. Shale
		PSS Penn. Sandstone
UNCONFORMITY		
MISSISSIPPIAN		MBL Miss. Burlington Ls.
		MFD Miss. Pierson Dol-Ls.
		MNS Miss. Northview Shale
		MSC Miss. Sedalia-Compton Ls.
UNCONFORMITY		
DEVONIAN-MISS		UMS Dev.-Miss. Sylamore Sh. & Ss.
UNCONFORMITY		
ORDOVICIAN		OSS Ord. Sand
		OOB Ord. Dol-Ls
		OSBG Ord. Shale
		OSB Ord. Sand
		OCS Ord. Clayey
		OCD Ord. Cotte

GEOLOGIC MAP LEFT ABUTMENT
based on Photographs Elevation & stations approx



UNCONFORMITY

OSS Ord Sandstone

UNCONFORMITY

OOB Ord. Dol-Ls & Chert Breccia

OSBG Ord. Shale Breccia Green

OSB Ord. Sandy Shale Breccia

OCS Ord. Clayey Sand

OCD Ord. Cotter Dolomite-Limestone

BUTMENT

Elevation & stations approximate

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KANSAS CITY, MISSOURI

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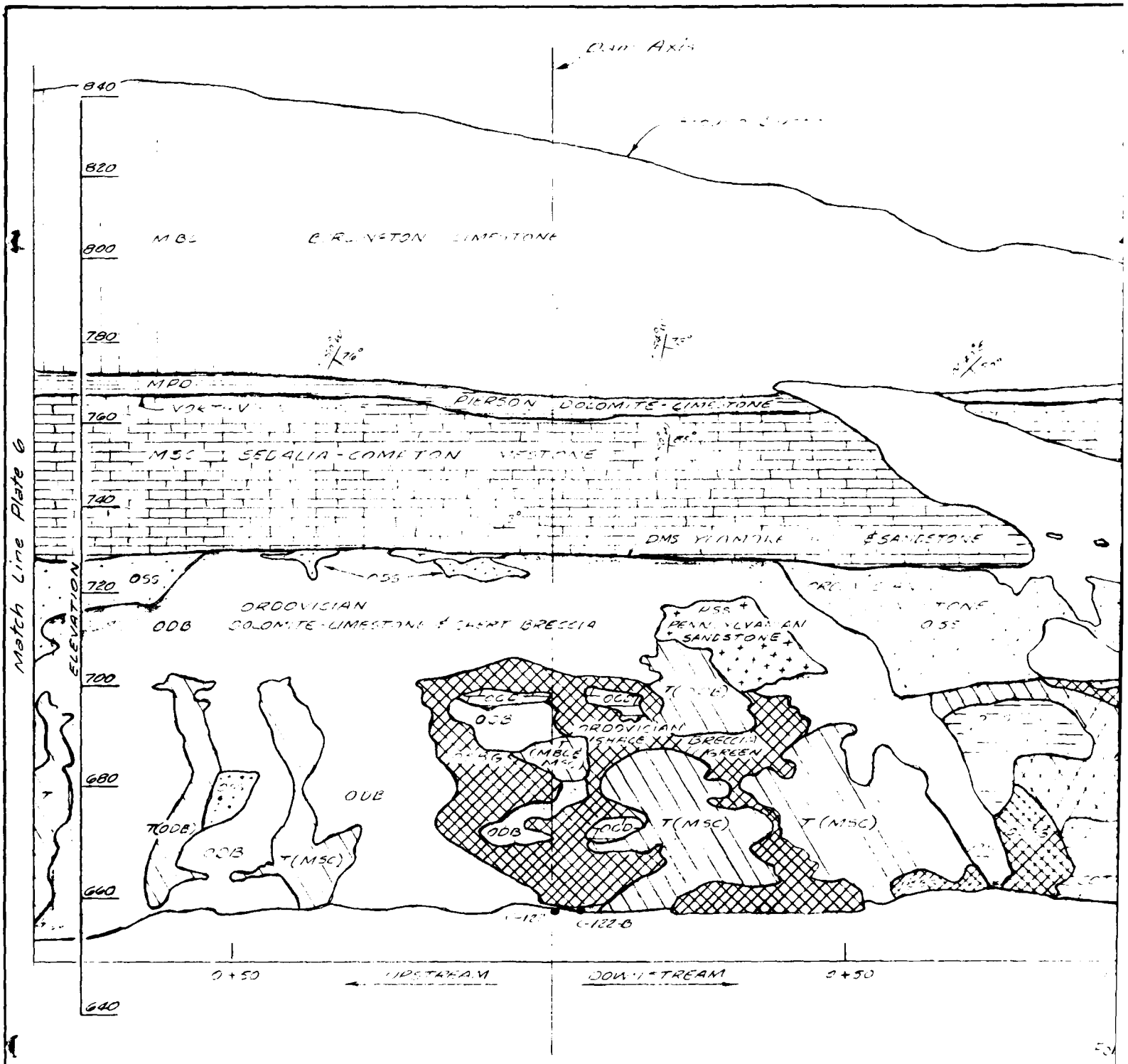
CONSTRUCTION FOUNDATION REPORT

GEOLOGIC MAP LEFT ABUTMENT, UPSTREAM

AS SHOWN

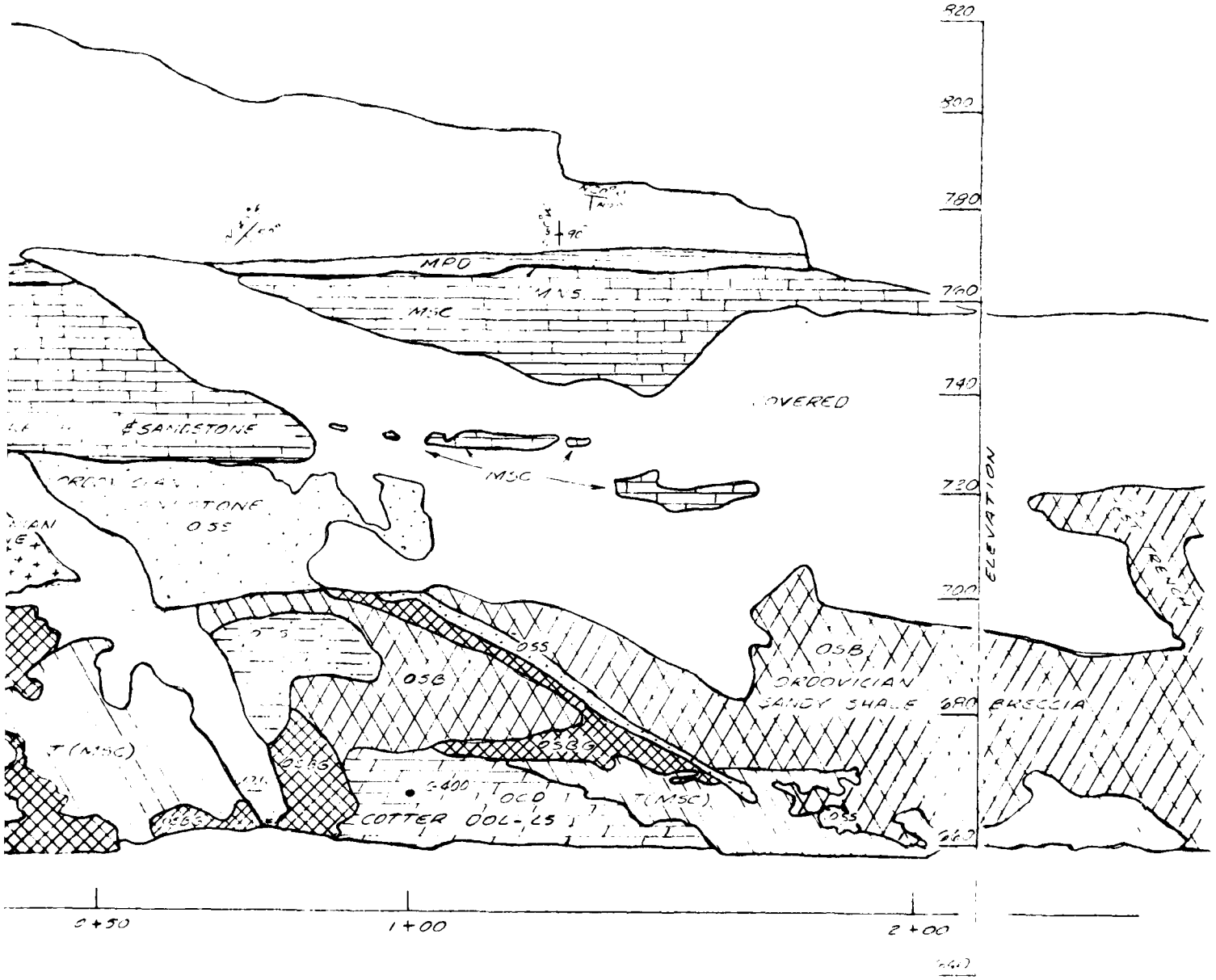
MARCH 1955

PLATE NO. 6



GEOLOGIC MAP LEFT ABUTMENT

based on Photographs Elevation & Stations approximate



For legend see plate 6

T ABUTMENT

...vation & stations approximate

U. S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY MISSOURI

OSAGE RIVER, MISSOURI
HARRY S. TRUMAN DAM & RESERVOIR
CONSTRUCTION FOUNDATION REPORT

GEOLOGIC MAP LEFT ABUTMENT, DOWNSTREAM

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Drawn by	
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Submitted by	
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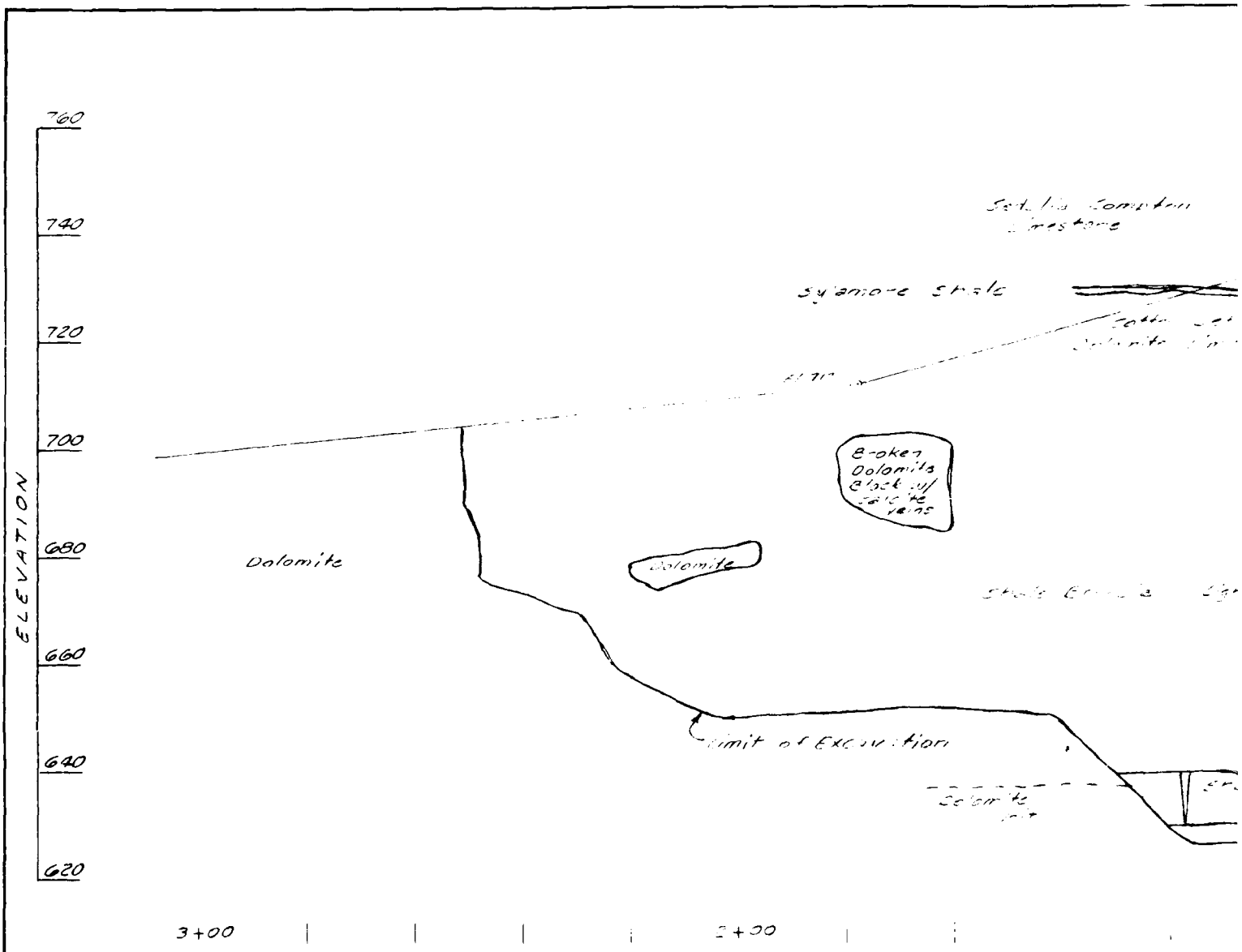
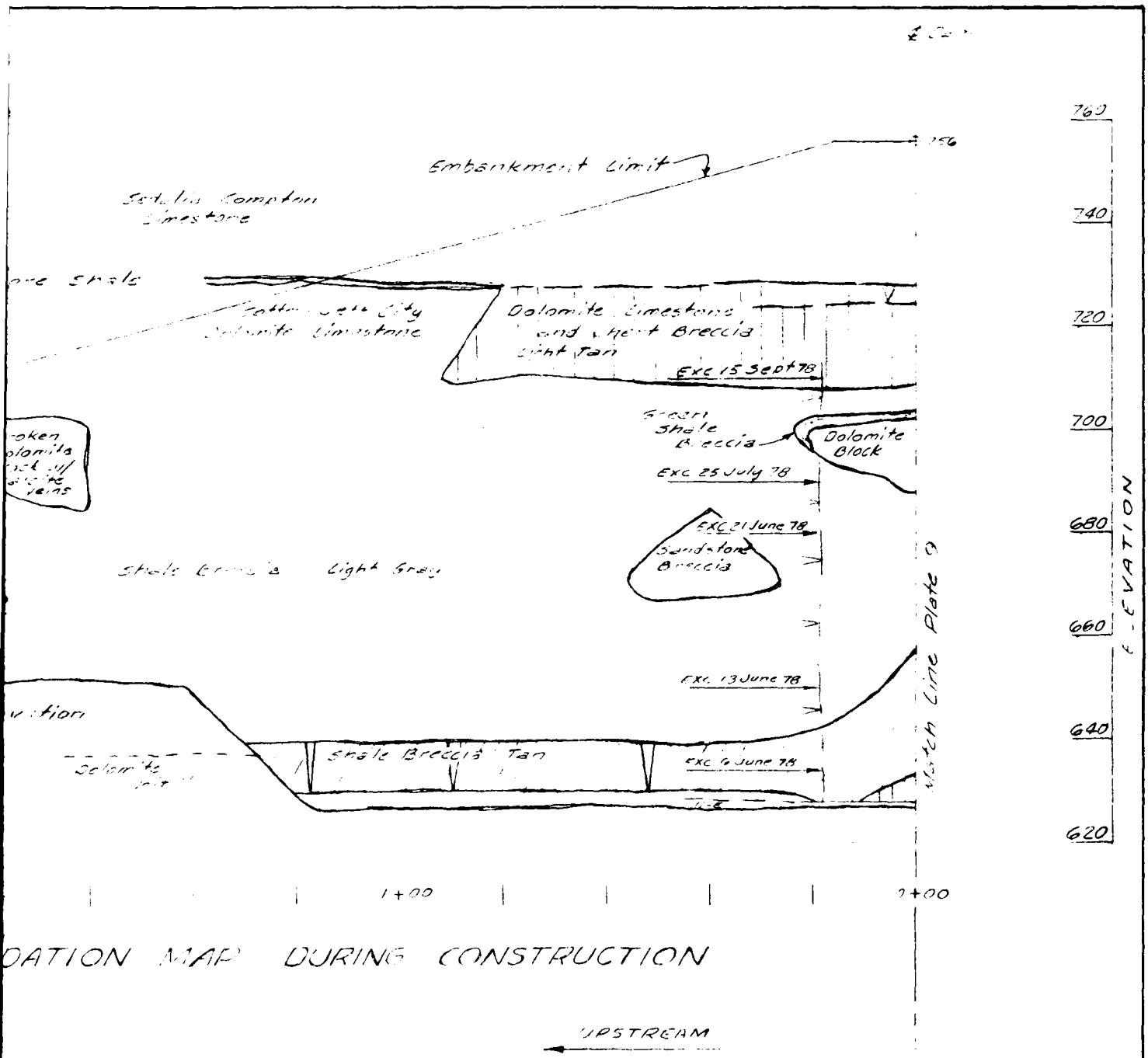
Sheet number	
File No.	0-12-9137

PLATE NO. 7



LEFT ABUTMENT FOUNDATION MAP DJR



DATION MAP DURING CONSTRUCTION

0 20
SCALE IN FEET

Revisions			
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U. S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
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CONSTRUCTION FOUNDATION REPORT

LEFT ABUTMENT FOUNDATION MAP, UPSTREAM DURING

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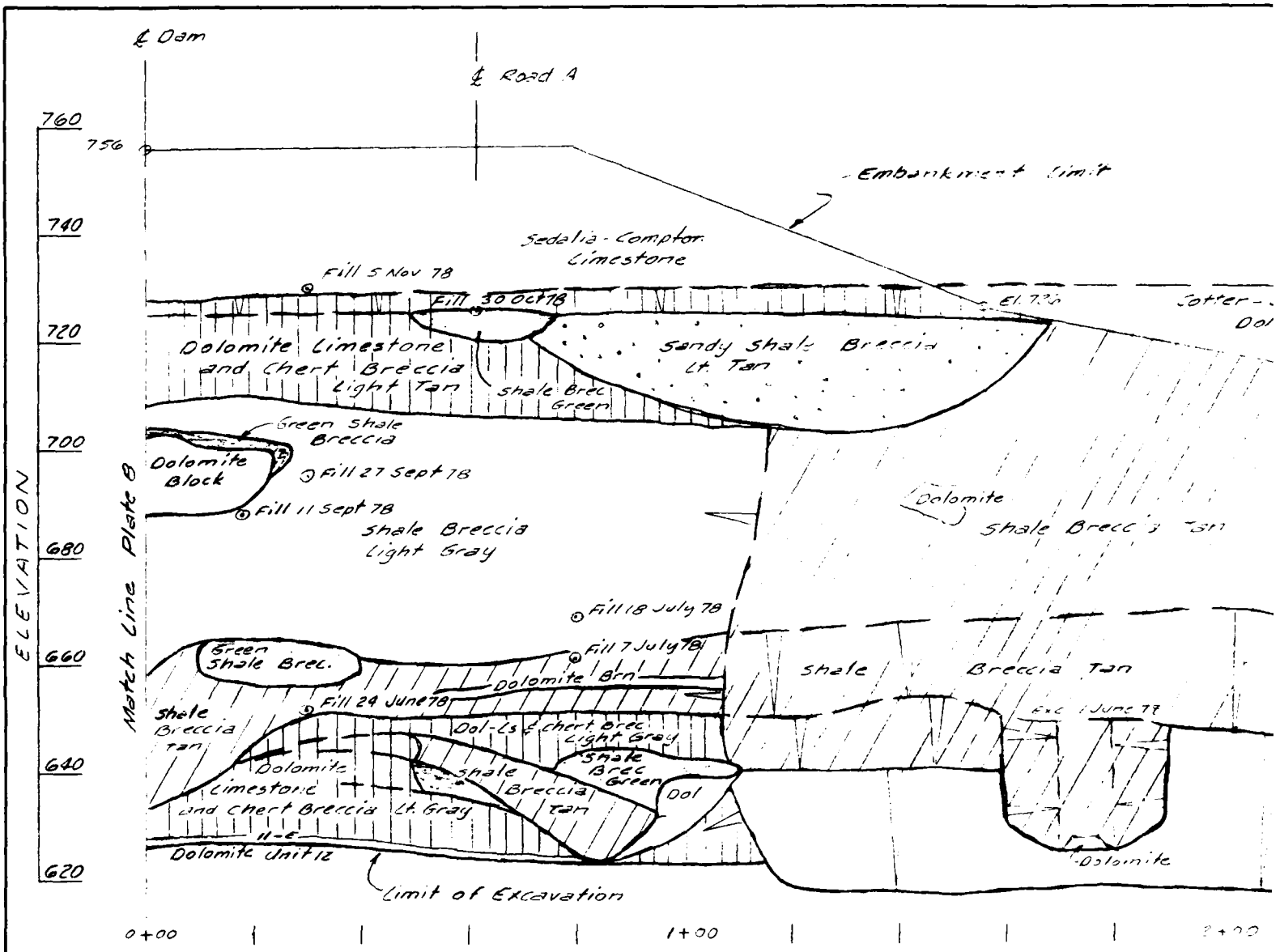
PLATE NO. 8



LEFT ABUTMENT FOUNDATION MAP DURIN

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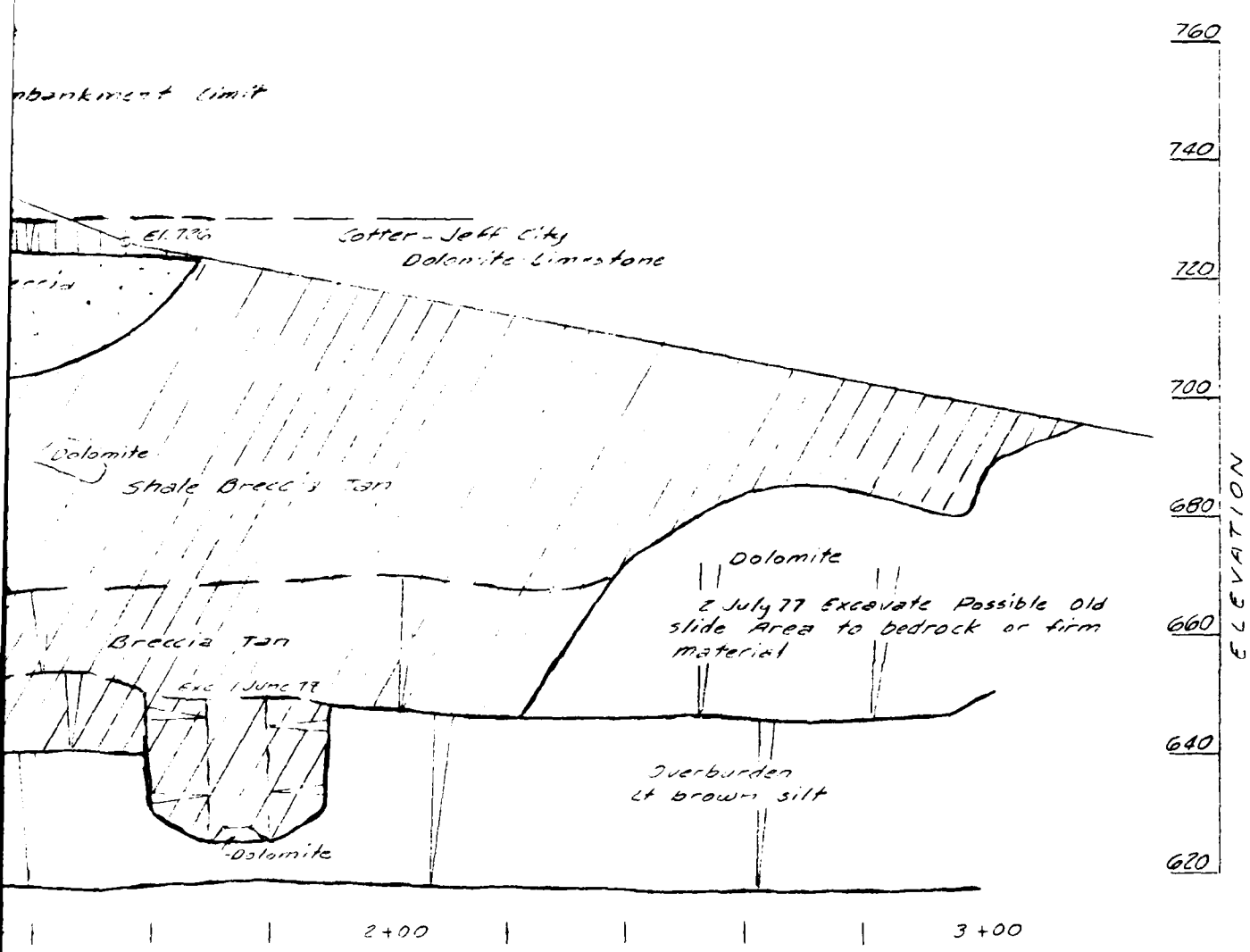

ATION MAP DURING CONSTRUCTION

20
IN FEET

Revisions			
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CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

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Checked by:
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US Army Corps of Engineers

OSAGE RIVER, MISSOURI
HARRY S. TRUMAN DAM & RESERVOIR
CONSTRUCTION FOUNDATION REPORT

LEFT ABUTMENT FOUNDATION MAP
DOWNSTREAM DURING CONST.

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Date: MARCH 1986
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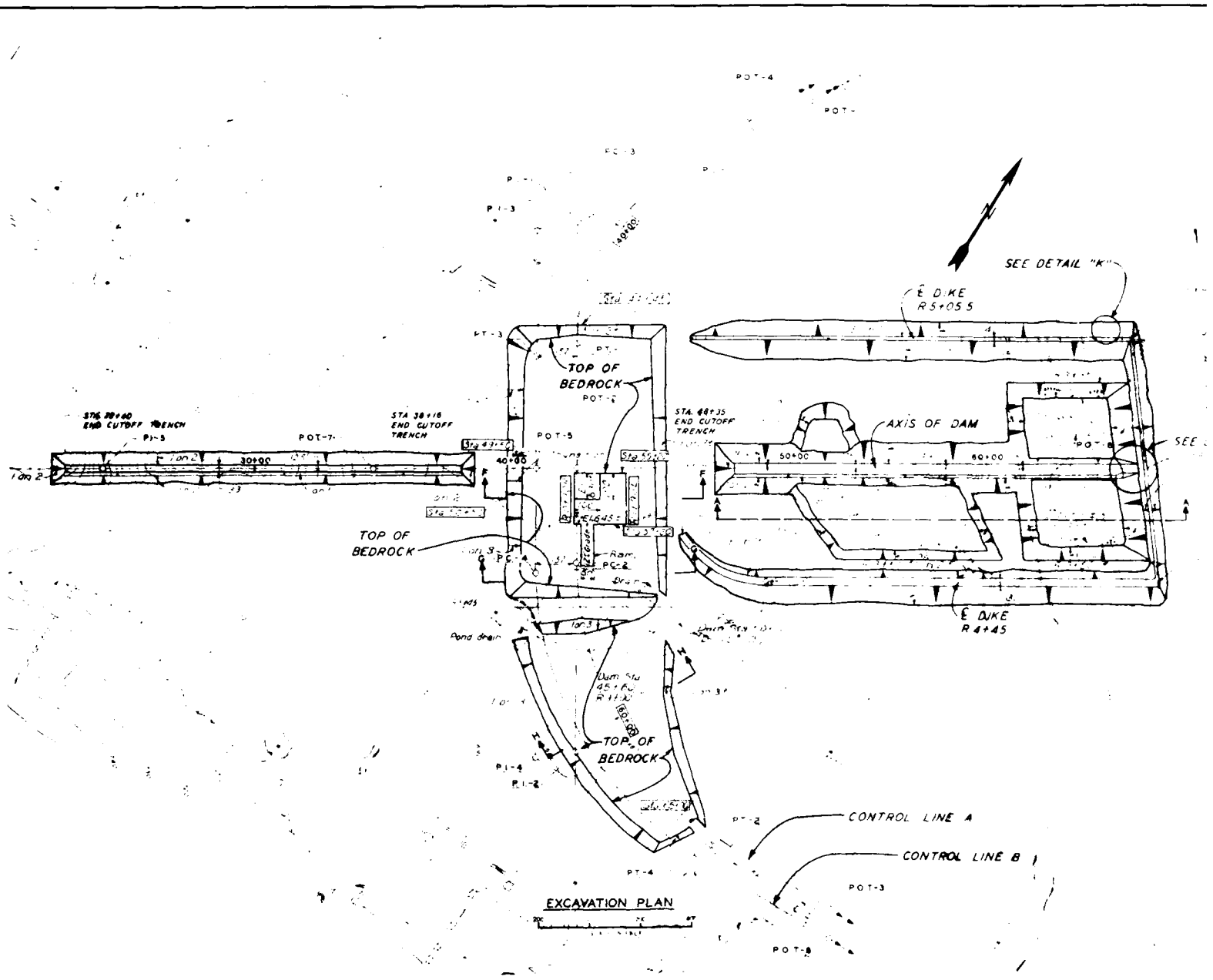
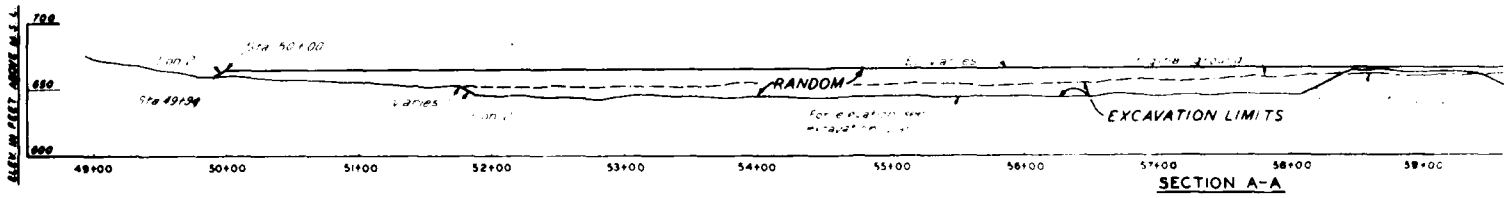
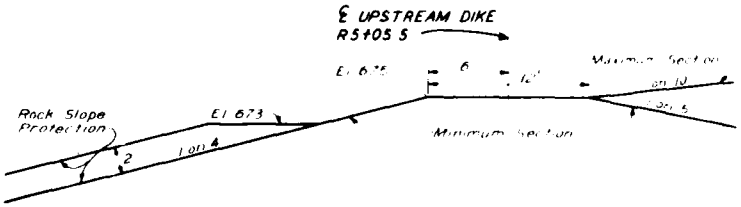
File No. 0-12-9139

PLATE NO. 9







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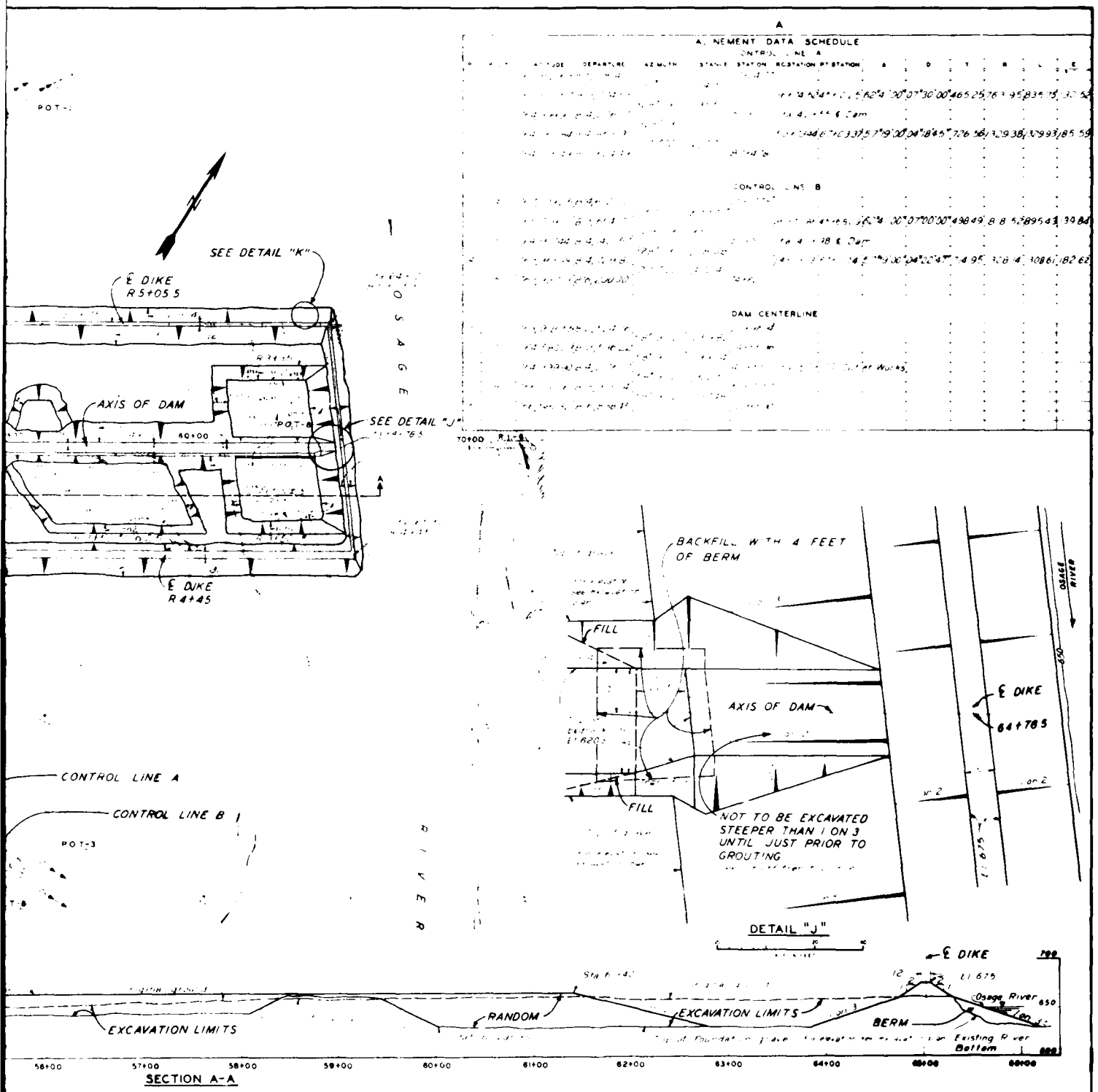

LEGEND

STA 40+00 · R1+00 = OUTLET WORKS CONTROL LINE A STATION OR RANGE
STA 50+00 · R2+00 = EMBANKMENT STATION OR RANGE

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Symbol	Revisions Descriptions	Date	Approved

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KANSAS CITY, MISSOURI

US Army Corps of Engineers

CONSTRUCTION FOUNDATION REPORT

EXCAVATION PLAN AND DETAILS

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Checked by
Submitted by
Scale
Date MARCH 1986
Drawing No.
Sheet Number
No. 0-12-9140

PLATE NO 10

LITHOLOGIC DESCRIPTIONS

UPPER CUTOFF TRENCH STA 22+30 to 38+00

Symbol	Lithologic Description	Symbol
D-1	2.8' thick - Dolomite, light gray brown, very thin bedded with pyrolusite precipitate on bedding surfaces. Unit is hard and moderately weathered with brown stain along scattered discontinuous vertical fractures.	DB-1
D-2	Dolomite - 3.5' thick - light gray-brown with lamellar shales interspersed throughout upper third of unit. Unit contains deformed undulating beds, very thin bedded, badly fractured with hairline black stained (pyrolusite) fractures vertically oriented. Unit is lightly weathered and moderately hard.	
D-3	Dolomite - 5.0' thick - light gray, very thin to thin bedded, flaggy, microcrystalline, lightly weathered, hard and breaks with conchoidal fracture. Exposed bedding surfaces exhibit reniform surface of ripple mark nature. Potholes and caves found to be most common in this unit.	DB-2
D-4	Dolomite - brown-gray, gnarly, massive, tripolitic, with scattered intruded shale breccia. No apparent bedding distinguishable. Black and white chert fragments scattered throughout. Mass constitutes a random orientation of fragments and blocks, lightly weathered, hard.	DB-3
D-5	Dolomite - gray, hard, intensely fractured and tightly consolidated. Fragment size 1 to 3". Black stained fracture faces are common.	DB-4
D-6	Dolomite, tripolitic, brown-gray, massive, hackly, hard, with an intense high angle fracture pattern, badly distorted, unweathered to moderately weathered. Unit is overlain by dolomite blocks in random orientation in a shale matrix.	DB-5
D-7	Dolomite, gray, lightly weathered, with scattered high angle fractures, microcrystalline, and thin bedded (bedding 6 - 12")	
D-8	Dolomite, pink, very thin bedded (bedding 2 - 3") moderately weathered, badly fractured with random orientation of high angle fractures.	
D-9	Dolomite, gray and brown-gray, very thin bedded (beds 2 - 6") with lamellar interbedded dolomite shales, blue and white, and paper thin shale lamellae. Dolomite badly fractured with considerable tight high angle fractures. Pyrolusite dendrites common in fracture faces. Beds undulating, lightly weathered to unweathered,	DB-6
D-10	Dolomite, brown, hackly, massive, tripolitic, lightly to moderately weathered and with scattered black chert.	
D-11	Dolomite, gray, microcrystalline, hard, unweathered, lightly fractured, thin bedded, bedding 6 - 18", and deformed at scattered instances with shale intrusions, gently undulating.	
D-12	Dolomite, hard, gray, lightly weathered with staining along fracture faces, very thin bedded (beds 2 - 4") with definite ripple mark bedding contacts.	
D-13	Dolomite - 1.0' thick - brown-gray, with considerable black chert in pockets and seams, very thin bedded to thin bedded (beds 1 - 3").	
D-14	Dolomite, gray and brown gray, very thin bedded, beds 1/2 - 2", flaggy, unweathered, tight and hard.	
D-15	Dolomite, light brown-gray, hackly, beds 3 - 6".	
D-16	Dolomite, gray, very thin bedded (<2"), unfractured. Surface resembles shale.	

LITHOLOGIC DESCRIPTIONS

UPPER CUTOFF TRENCH STA 22+30 to 38+00

Symbol	Lithologic Description
DB-1	Dolomite Breccia - tightly consolidated pieces of red-brown, gray, and gray-brown dolomite in a blue-gray shale matrix. Dolomite is hard and competent. Shale is soft and unweathered. Chert is scattered throughout in random orientation. Fragments shapes are angular to subrounded and rounded and of varying sizes from 3/8" to 3 and 4 foot blocks. Overturned beds are strongly evident. The bottom of the dolomite breccia is 5 feet above the toe of slope and has lamellar bedding characteristics (L1"). The beds dip N 50 W 26° NE at Sta 27+87 and become vertical at 27+90. The unit becomes badly fractured with considerable high angle fracture brown stained and radiating outward along the arc of the curve.
DB-2	Dolomite blocks in shale and sandstone matrix [illegible]ray, hard and unweathered. Blue-gray shale containi[illegible] - Ø4 fragments of white shale scattered throughout. Slickensides are common. Dolomite blocks range in size from 0.5' to 4.0' resting in a random pattern.
DB-3	Dolomite, gnarly, deformed and broken into blocks with blue-gray shale and chert fragments scattered throughout. Units are competent but detached and locally situated without orientation.
DB-4	Dolomite blocks in shale and shale breccia, tight, unfractured, in a random pattern unweathered to li[illegible]tly weathered.
DB-5	Dolomite blocks in black and blue shale and shale breccia, lamellar to very thin bedded, (containing flaggy characteristics). Blocks appear molded with subrounded edges and shale in the interstices often lapping over the edge of the dolomite like foliae. The dolomite is hard, gray and unweathered. Shale is moderately hard, black to blue-gray, lamellar to fissile and unweathered. Between Sta 34+60 and 35+00, scattered dolomite breccia and intensely fractured dolomite rehealed, with black chert concretions, cobble size, are scattered throughout. Unit is lightly to badly weathered but tightly consolidated.
DB-6	Dolomite Blocks - 1.0' thick - intensely fractured in mass of dolomite breccia, gray, massive, lightly to unweathered.

Revisions

Symbol	Descriptions	Date	Approved

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HARRY S TRUMAN DAM & RESERVOIR
CONSTRUCTION FOUNDATION REPORT

LITHOLOGIC UNIT DESCRIPTION,
UPPER CUTOFF TRENCH
STA 22+30 TO STA 38+00 SH 1

Scale
Sheet number
Date MARCH 1966
Dwg No
File No 0-12-9141

PLATE NO 1

LITHOLOGIC DESCRIPTIONS

UPPER CUTOFF TRENCH STA 22+30 to 38+

Symbol	Lithologic Description
DS-1	Dolomite with interbedded blue-gray, lamellar shale, brown, very thin bedded (less than 1") lightly to moderately weathered and brown stained, and hard. Gently undulating beds contained scattered chert and considerable high angle fractures with brown stain faces. Bedding surface exposures exhibit a knobbly surface resembling ripple marks.
S-1	0.2' thick - Shale, gray-green, lamellar, with badly deformed beds and considerable dolomite fragments intruded into the shale mass, lightly to moderately weathered, moderately hard.
S-2	Shale - 0.5' thick - gray-green, fissile, lightly weathered, moderately hard. Considerable number of chert concretions resembling suspect biostrome of possible permineralized pelecypods, brachiopods or both.
S-3	Dolomitic Shale - 1.0' thick - gray-green, lamellar to fissile, lightly weathered, moderately hard, unfractured and containing scattered lamellar interbeds of dolomite, gray, moderately hard.
S-4	Shale, white and blue-gray, vertically dipping with scattered red beds and chert fragments. The contact vicinity of Sta 28+10 is rust brown, soft. Suspect grout take zone is in this area.
S-5	Shale, yellow-brown with chert scattered throughout. Only a trace of structure remaining as most of this unit has decomposed to soil.
S-6	Shale, white, lamellar, soft, decomposed, with slickensides locally.
S-7	Shale, white and green-gray, lamellar and interbedded in a random pattern, moderately weathered, soft, tight, and with scattered brown staining.
S-8	Shale, red and gray mottled with sandstone gravels and lenses scattered throughout; rust-brown and gray-brown. Considerable skickensided surfaces portraying a gnarly surface, massive but badly fractured. Structure reflects shale lithified then collapsed. Subsequent reconsolidation and lithification developed. Local lamellar bedding is discontinuous and distorted.
S-9	Shale, gray, lamellar, moderately soft, unweathered, unfractured but badly deformed by undulatory beds.

Symbol
SB-1
SB-2
SB-3
SB-4
SB-5
SS-1
SS-2
SS-3
SS-4
SS-5
SS-6
SS-7

LITHOLOGIC DESCRIPTIONS

UTOFF TRENCH STA 22+30 to 38+00

Symbol	Lithologic Description
SB-1	Shale Breccia - black-gray, unweathered, soft, unstable, with fine grained dolomite and chert fragments in subangular shapes (less than #4 screen) scattered throughout. A depression to a depth of 1.0' is formed by the presence of this unit.
SB-2	Shale and Shale Breccia - scattered rust stained sandstone in shale and shale breccia ranging from rust brown to white with red streaks, lamellar to very thin bedded but dipping in a random pattern from high angle to horizontal, soft to hard. Pockets of chert, red, black, and white are scattered throughout.
SB-3	Shale and Shale Breccia with interbeds of sandstone; soft, friable and rust-brown to red in random orientation. Shale, white to blue-gray, lamellar and badly deformed beds generally resting at high angles.
SB-4	Shale Breccia, brown, hackly, hard, moderately weathered with dolomite blocks subrounded 3 - 12" in size, scattered throughout as float.
SB-5	Shale breccia, black dolomite and chert fragments in black shale breccia, unweathered, locally pyritized, moderately hard.
SS-1	Sandstone, soft, friable, fine grained to silty, poorly sorted, white, rounded with varigated limonite, red and green scattered throughout. CL comprises the matrix.
SS-2	Sandstone, soft, friable, golden brown, with limonite - red streaks scattered in discontinuous near horizontal pattern.
SS-3	Sandstone, flesh pink with variegated red streaks scattered throughout. Unit is composed of moderately hard, well sorted, fine grained, rounded sand grains. Bedding is thin to medium (4" to 48") with strike and dip ranging between N 8 E 10 SE and N 18 E 11 SE.
SS-4	Sandstone, white and brown-white, thin bedded, with flat lying beds 3 - 12" thick, moderately hard and friable. Grains are uniformily graded and rounded.
SS-5	Interblend of topsoil, black, and sandstone decomposed to sand, red, gray and with shale and clay, yellow, green, and gray. Chert fragments are scattered throughout. GC class. On the contact between overburden and competent rock is found dolomite, (in float) very thin bedded, gray to yellow-gray, badly weathered and stained along the fractures, badly fractured and containing considerable chert.
SS-6	Sandstone, red and red-brown, badly weathered and decomposed to sand, fine grained, well sorted, rounded and subrounded.
SS-7	Sandstone - 1.5' thick - fine ground, silty, lamellar, brown, soft and friable.

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US Army Corps of Engineers

OSAGE RIVER, MISSOURI
HARRY S. TRUMAN DAM & RESERVOIR
CONSTRUCTION FOUNDATION REPORT

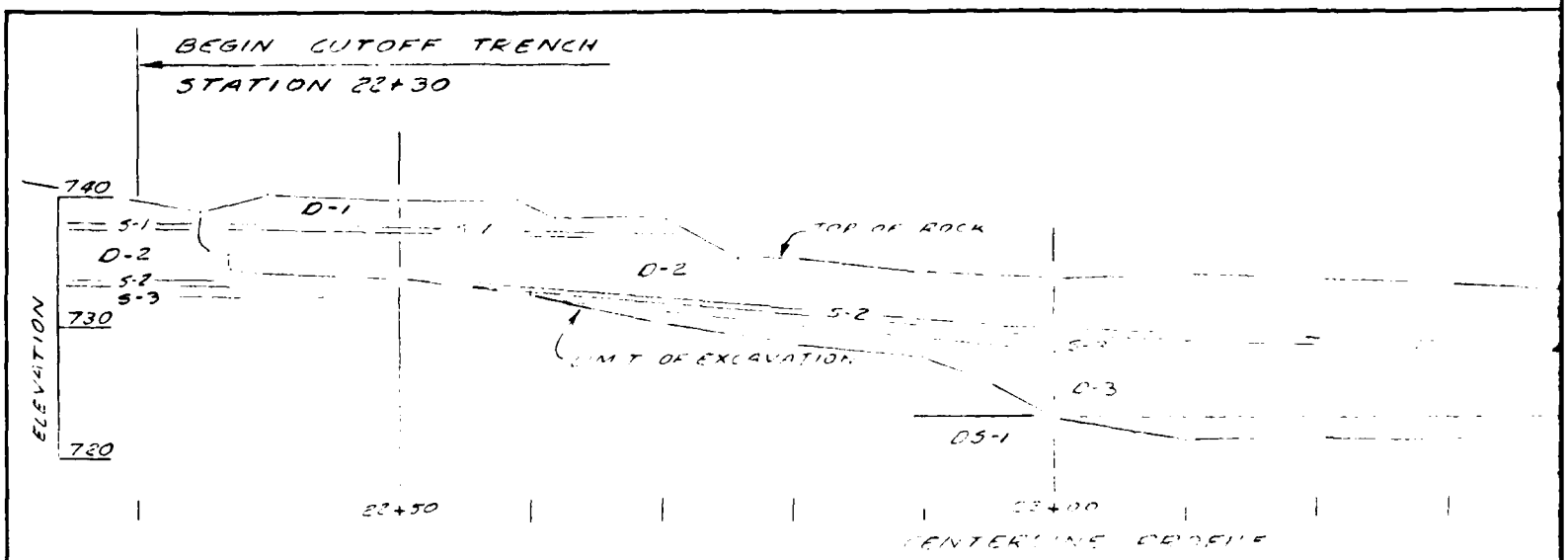
LITHOLOGIC UNIT DESCRIPTION,
UPPER CUTOFF TRENCH
STA.22+30 TO STA.38+00 SH.2

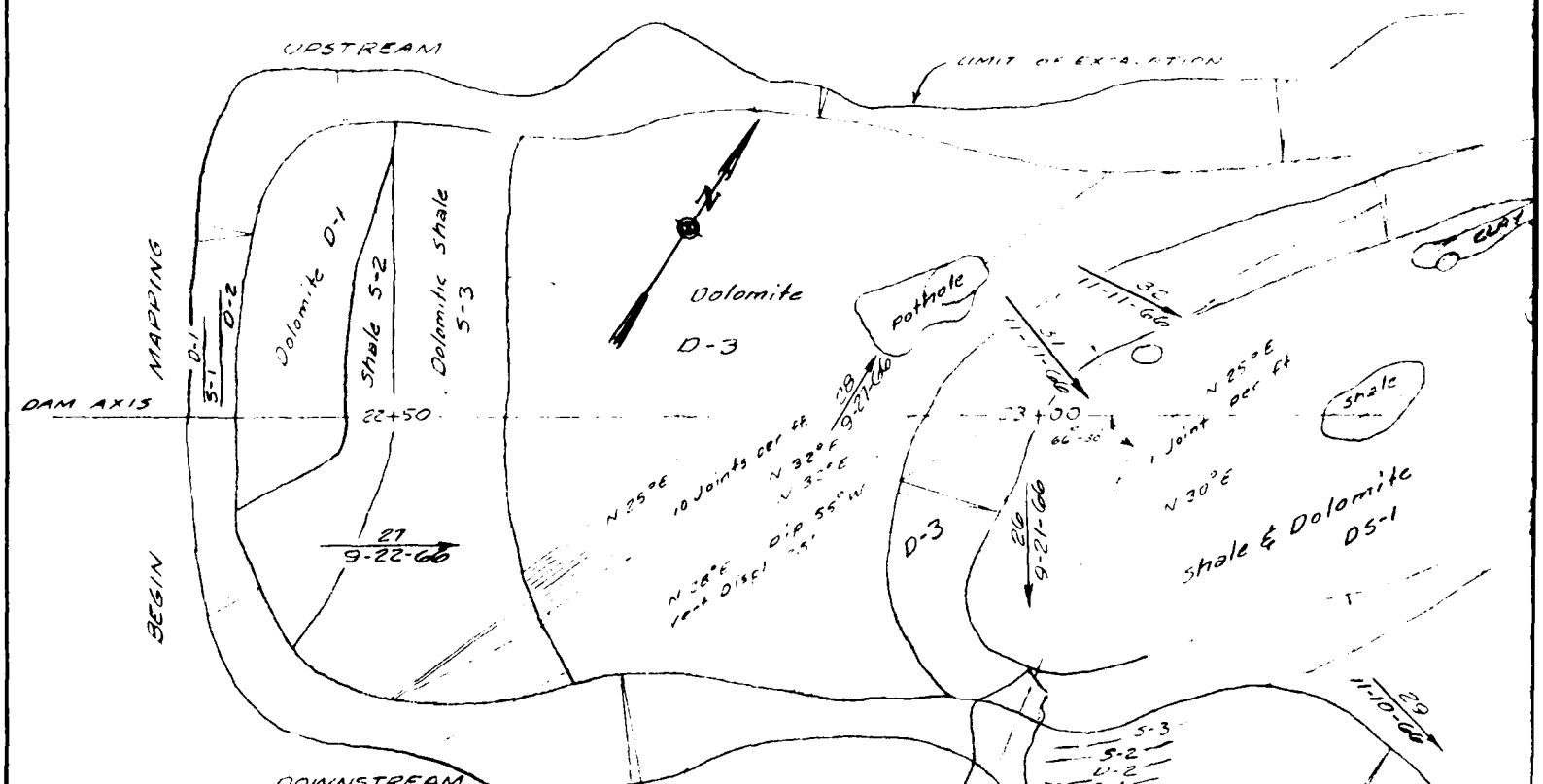
Scale
Sheet number
Date MARCH 1986
Dwg No
File No. 0-12-9142

Revisions			
Symbol	Descriptions	Date	Approved

Sheet 1 of 2

PLATE NO. 12





Revisions			
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CONSTRUCTION FOUNDATION REPORT

MAP CUTOFF TRENCH
STA 22+30 TO STA.24+08

Scale
Sheet number
Date: MARCH 1966
Dwg. No.
File No. 0-12-9143

STAGE I

MAP CUTOFF TRENCH
STA 22+30 TO STA 24+08

For Legend See Plates 11 & 12

Direction Date & Number of Photo

27
9-22-66

0

SCALE IN

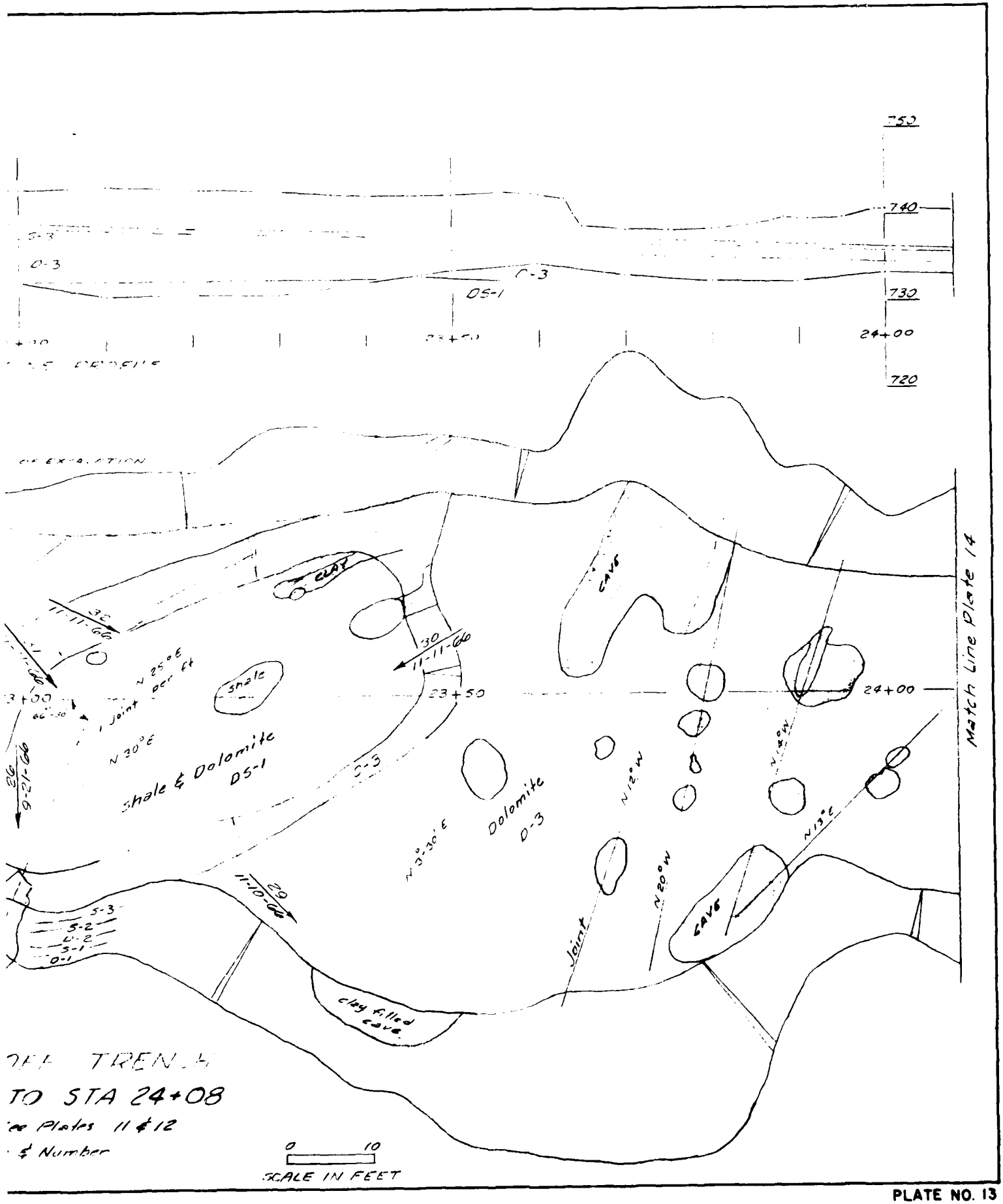
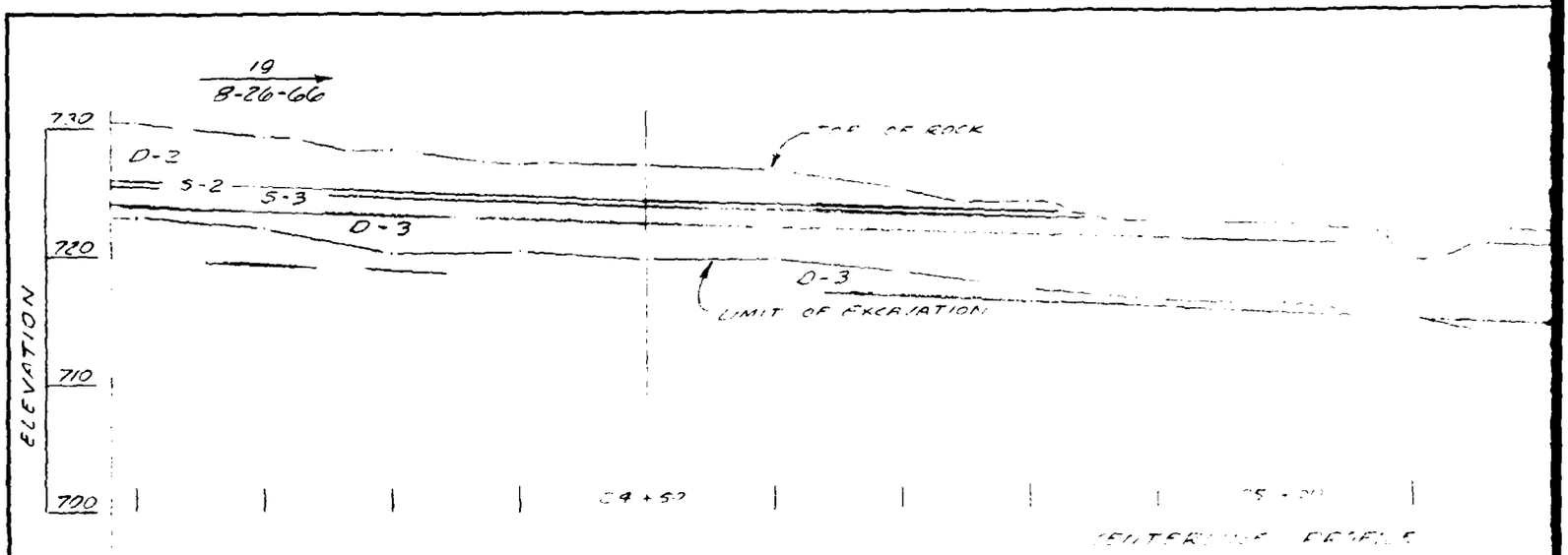
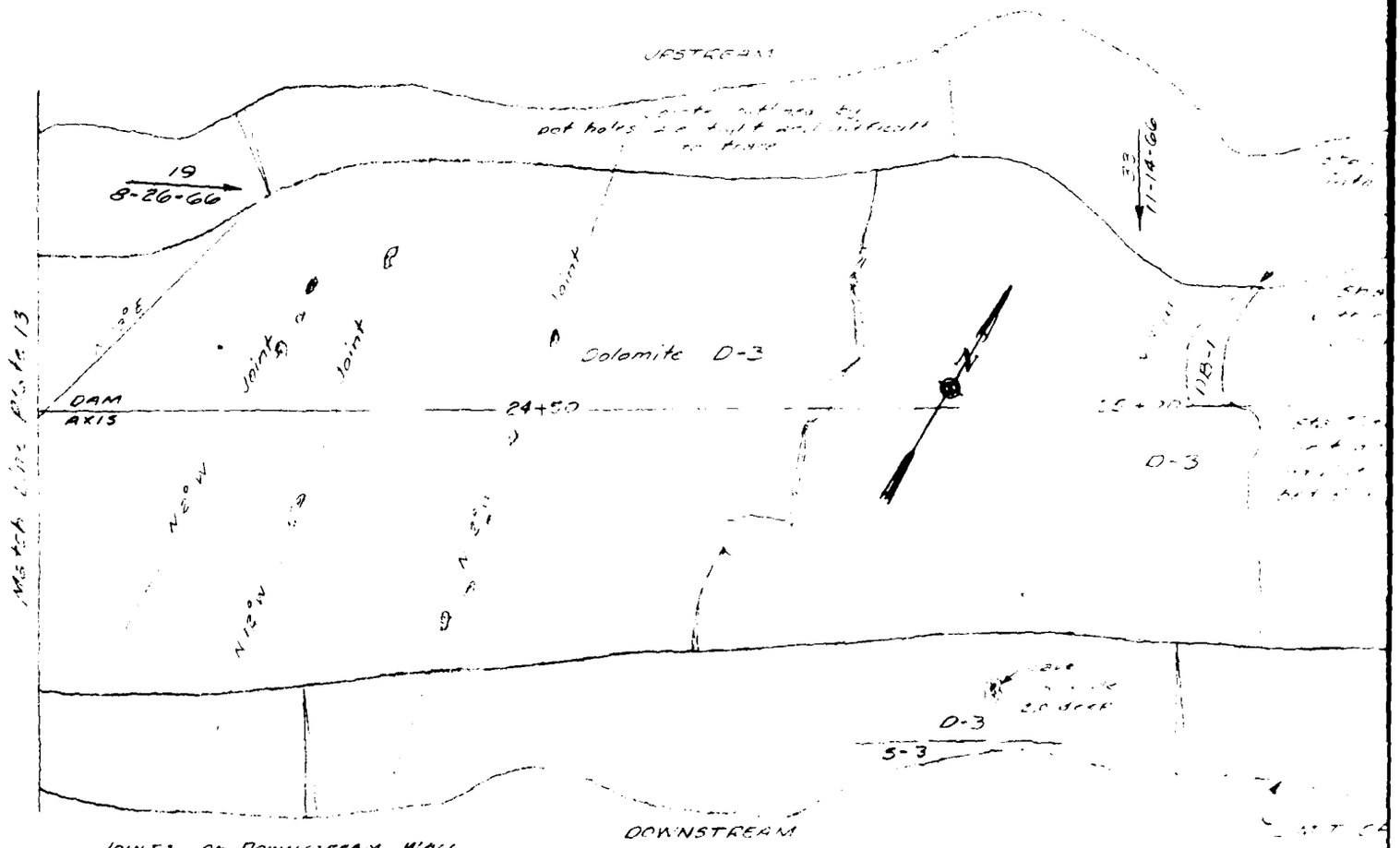

750
740
730
720
24+00
23+50
CLAY
CAVE
CAVE
CAVE
Shale
Shale & Dolomite
DS-1
Dolomite
D-3
N 25° E
Joint per ft
N 30° E
N 3°30' E
N 12° W
N 20° W
N 13° E
Joint
clay filled cave
Match Line Plate 14
TO STA 24+08
Plates 11 & 12
& Number
0
10
SCALE IN FEET

PLATE NO. 13





JOINTS ON DOWNSTREAM WALL

STATION	STRIKE	DIP
24+00	N 20° E	65° E
24+25	N 30° E	55° E
24+50	N 5° W	7° NE
25+70	N 5° E	8° SE
25+80	N 7° W	Vert

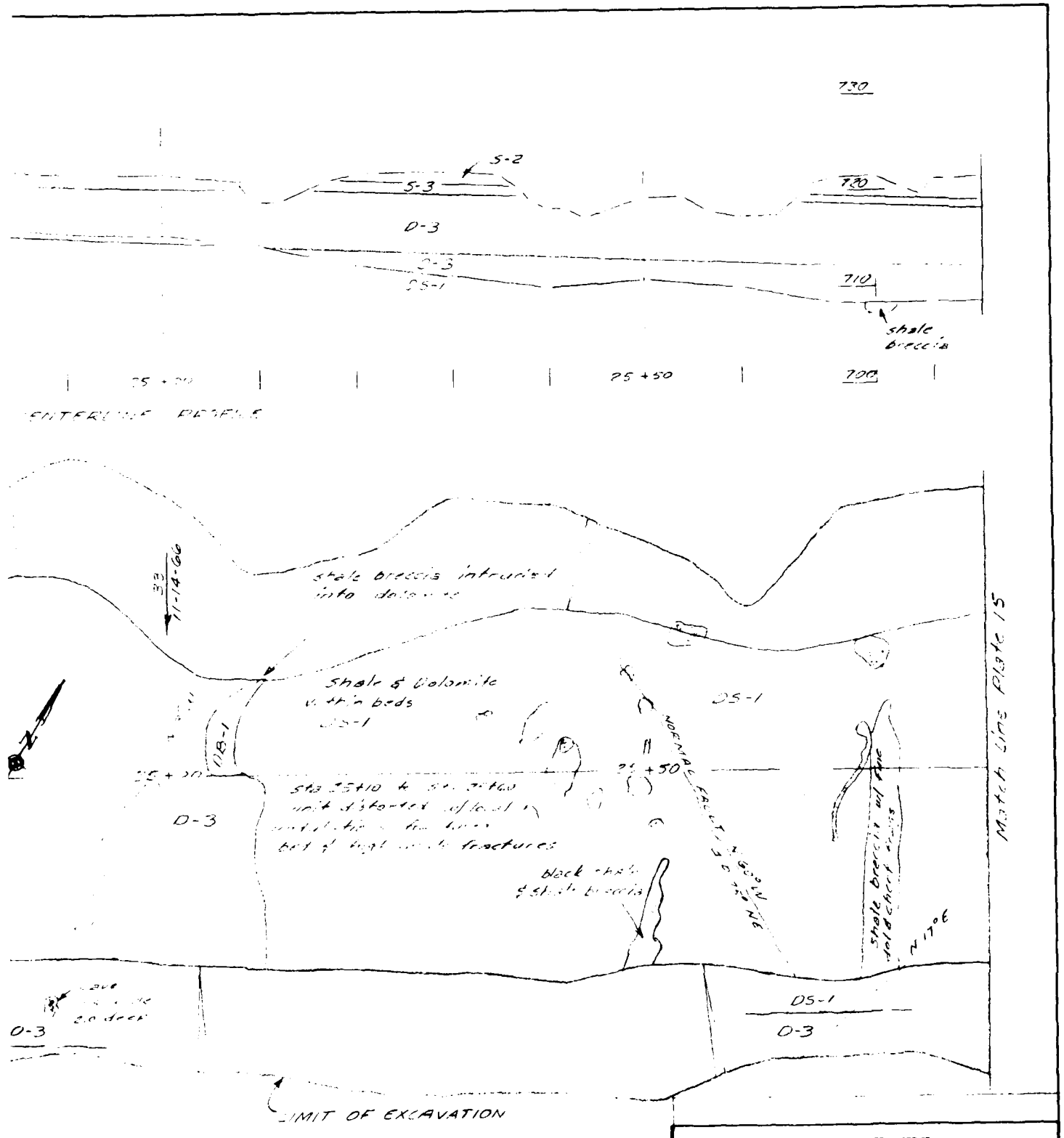
STAGE I

ROAD CUTOFF

STA 24+00 TO STA

For legend see Plates 11 & 12

19
8-26-66 Direction Date & Number of Photo



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HARRY S. TRUMAN DAM & RESERVOIR
CONSTRUCTION FOUNDATION REPORT

MAP CUTOFF TRENCH
STA.24+08 TO STA.25+85

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Date MARCH 1966
Sheet number
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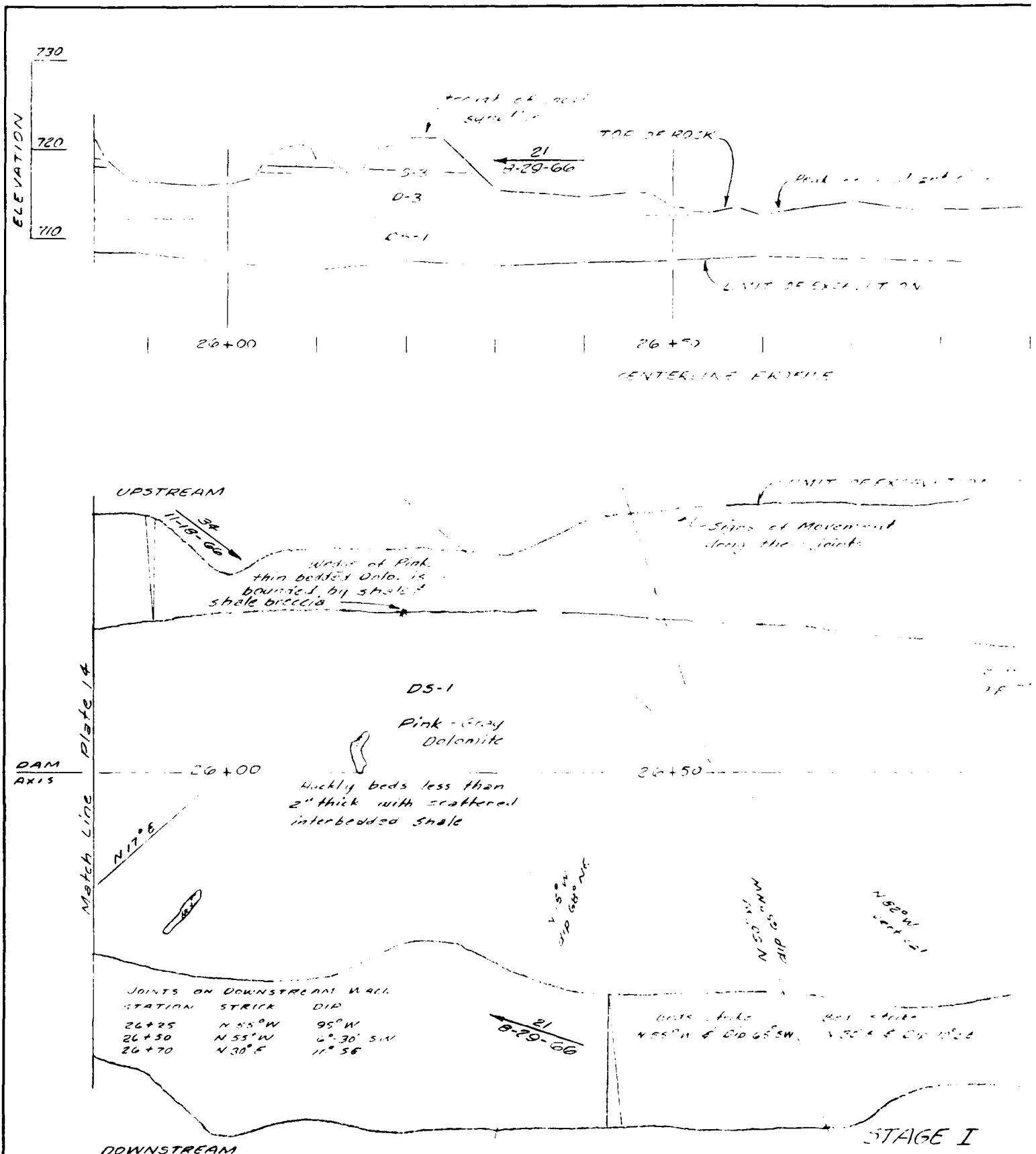
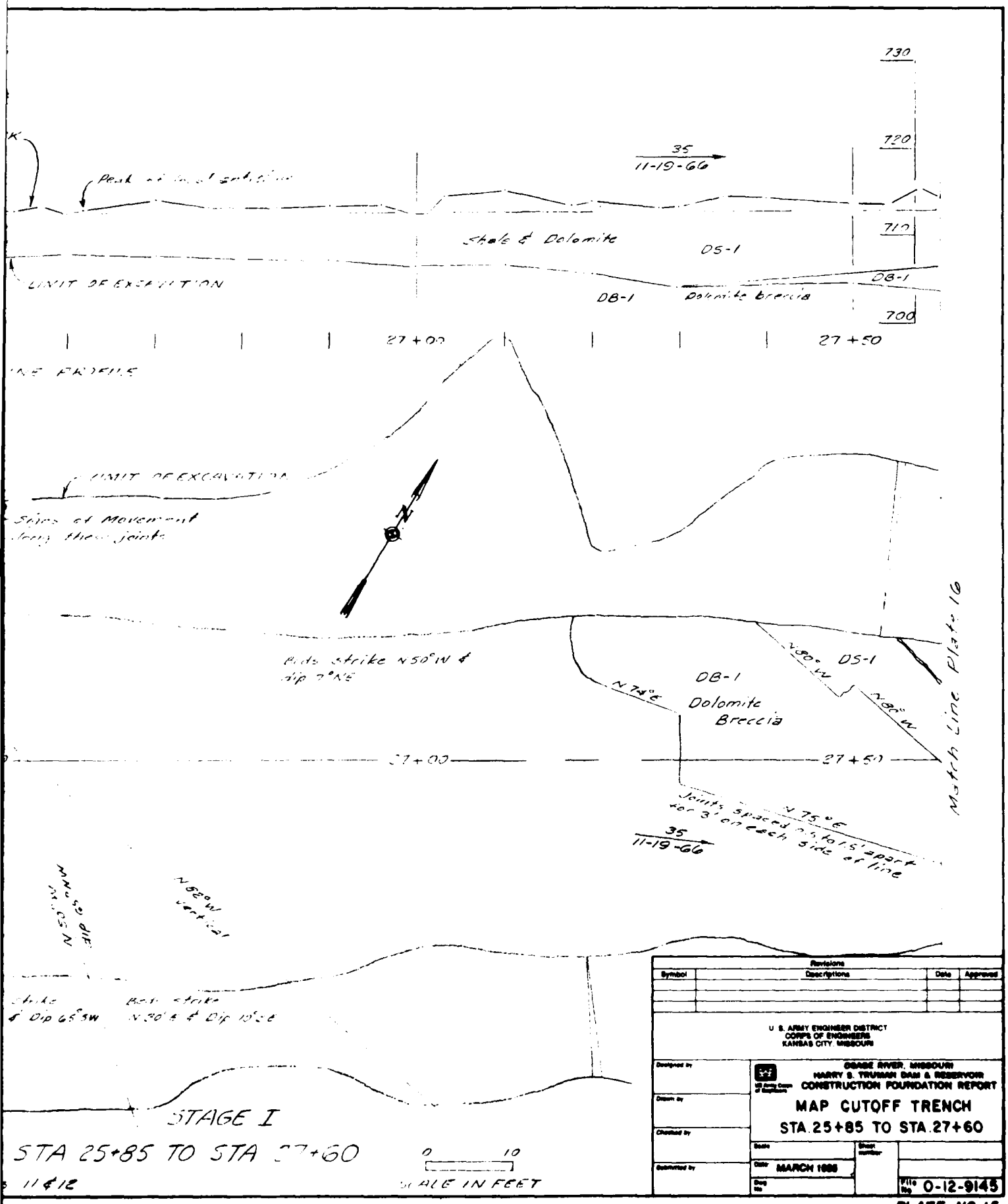
Revisions			
Symbol	Descriptions	Date	Approved

PLATE NO. 14


730
720
710
ELEVATION
TOE OF ROCK
21
8-29-66
D-3
26+00
26+50
CENTERLINE PROFILE
UPSTREAM
11-18-66
Wedge of Pink, thin bedded Dolo. is bounded by shale & shale breccia
DS-1
Pink - Gray Dolomite
DAM AXIS
26+00
26+50
Wackly beds less than 2" thick with scattered interbedded shale
N 17° E
Match Line
Plate 14
JOINTS ON DOWNSTREAM WALL
STATION STRIKE DIP
26+25 N 55° W 95° W
26+50 N 55° W 6°-30' S.W.
26+70 N 30° E 11° SE
21
8-29-66
DOWNSTREAM
STAGE I
Direction, Date, & Number of Photo
MAP CUTOFF TRENCH STA 25+85 TO STA
For Legend See Plates 11 & 12


730
720
710
700
35
11-19-66
Shale & Dolomite
OS-1
DB-1
Dolomite Breccia
27+00
27+50
Signs of Movement along these joints
Joints strike N50°W & dip 7°NE
N 74°E
DB-1
Dolomite Breccia
N 80° W
OS-1
N 80° W
Match Line Plate 16
Joints spaced on 1.5' apart for 3' on each side of line
N 75°E
35
11-19-66
N 62°W vertical
Strike & Dip 65°SW
Rock strike N 20°E & Dip 10°E
STAGE I
STA 25+85 TO STA 27+60
0 10
SCALE IN FEET
Revisions
Symbol
Descriptions
Date
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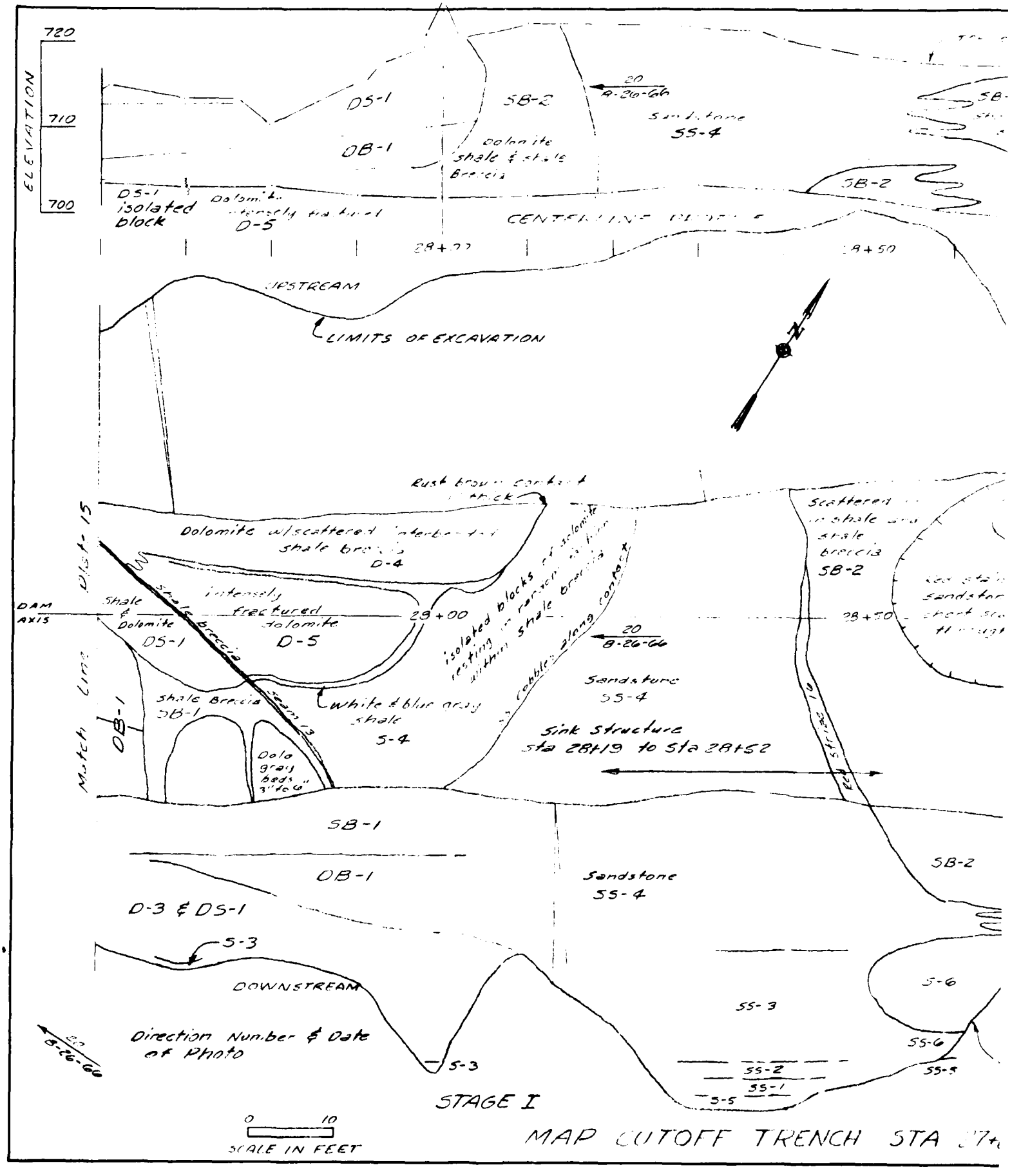
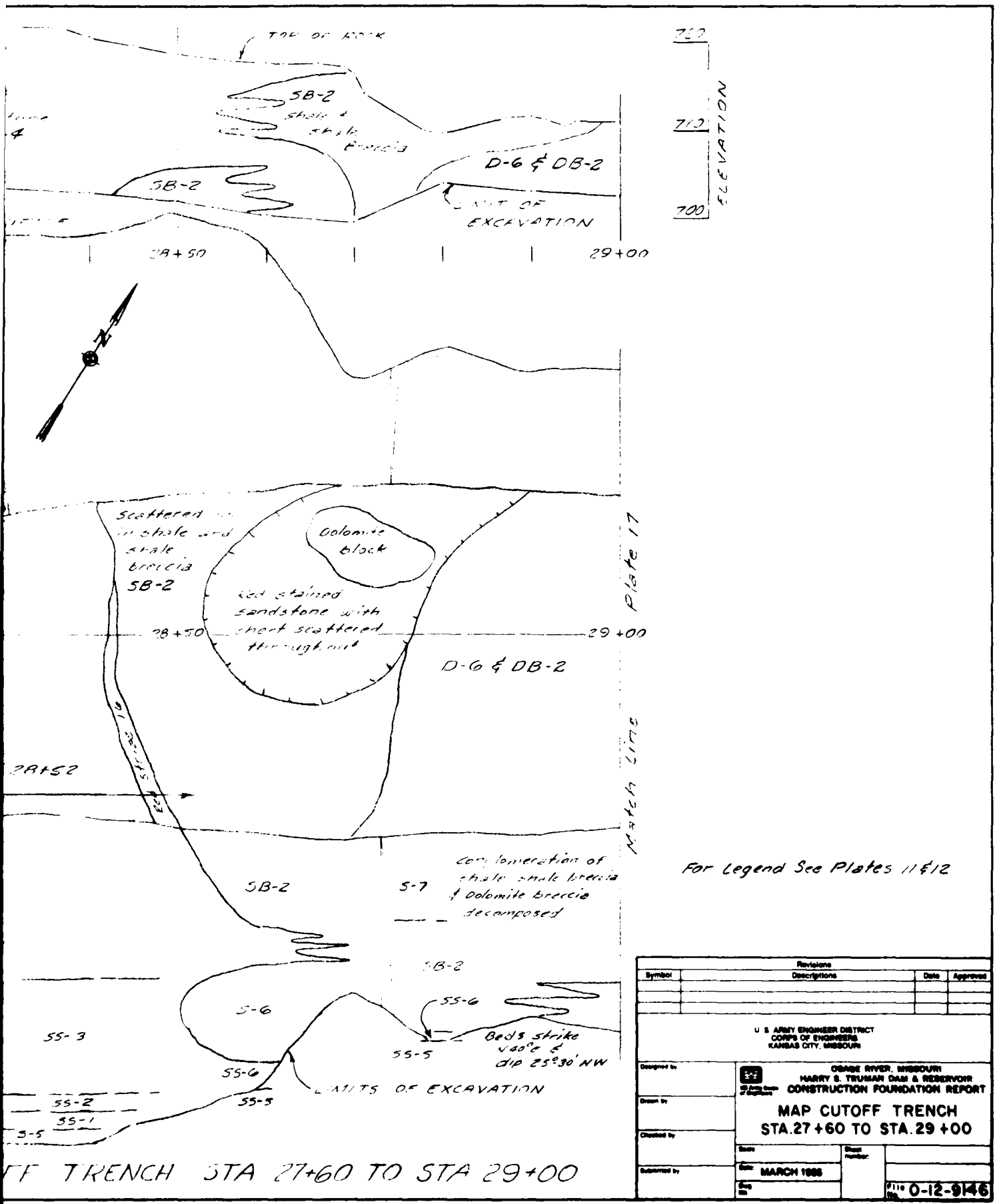
MAP CUTOFF TRENCH
STA. 25+85 TO STA. 27+60
Scale
Sheet number
Date MARCH 1966
File No. 0-12-9145

PLATE NO. 15



MAP CUTOFF TRENCH STA 27+



For Legend See Plates 11 & 12

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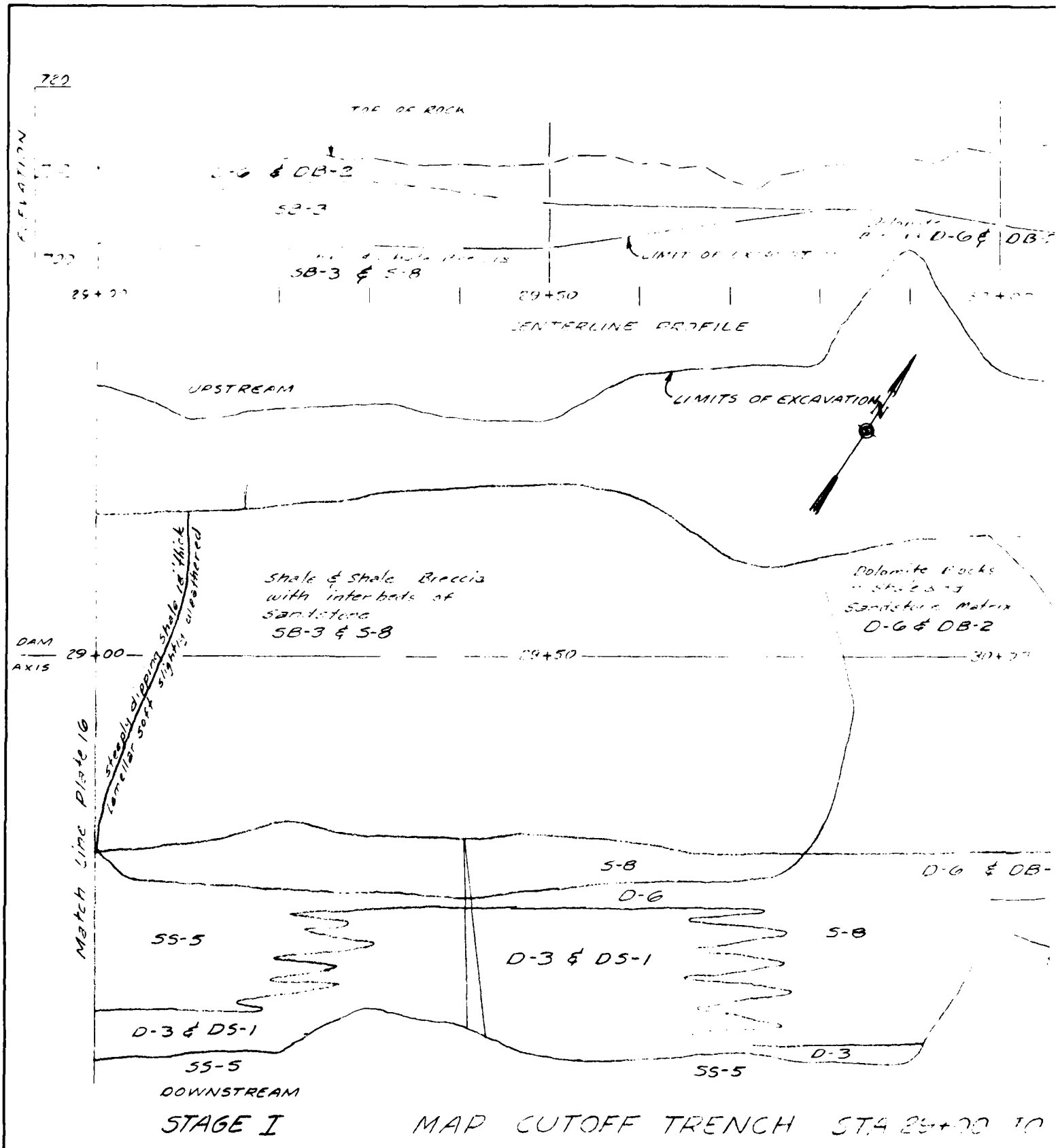
MAP CUTOFF TRENCH
STA. 27+60 TO STA. 29+00

Scale
Date: MARCH 1986
Sheet number
File No. 0-12-9146

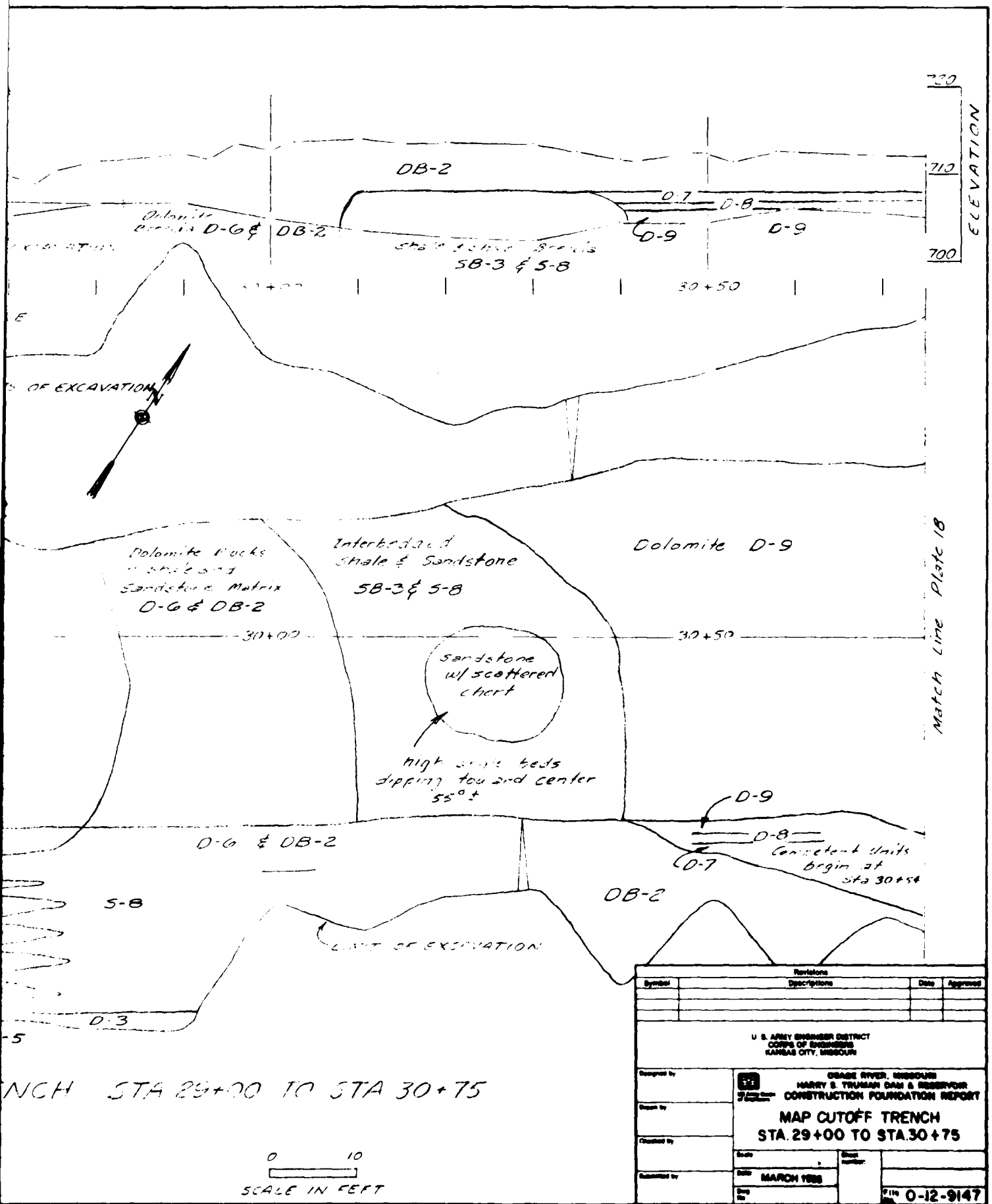
PLATE NO. 16



STAGE I MAP CUTOFF TRENCH STA 29+00 TO

For Legend See Plates 11 & 12

SCALE


720
710
700
ELEVATION
DB-2
D-7
D-8
D-9
D-9
D-6 & DB-2
SB-3 & S-8
30+50
OF EXCAVATION
Dolomite Rocks w/ Shale and Sandstone Matrix
D-6 & DB-2
Interbedded Shale & Sandstone
SB-3 & S-8
Dolomite D-9
30+00
30+50
Sandstone w/ scattered chert
high angle beds dipping toward center 55° ±
Match Line Plate 18
D-9
D-8
D-7
Competent units begin at sta 30+54
D-6 & DB-2
DB-2
S-8
LIMIT OF EXCAVATION
D-3
NCH STA 29+00 TO STA 30+75
0 10
SCALE IN FEET
Revisions
Symbol
Descriptions
Date
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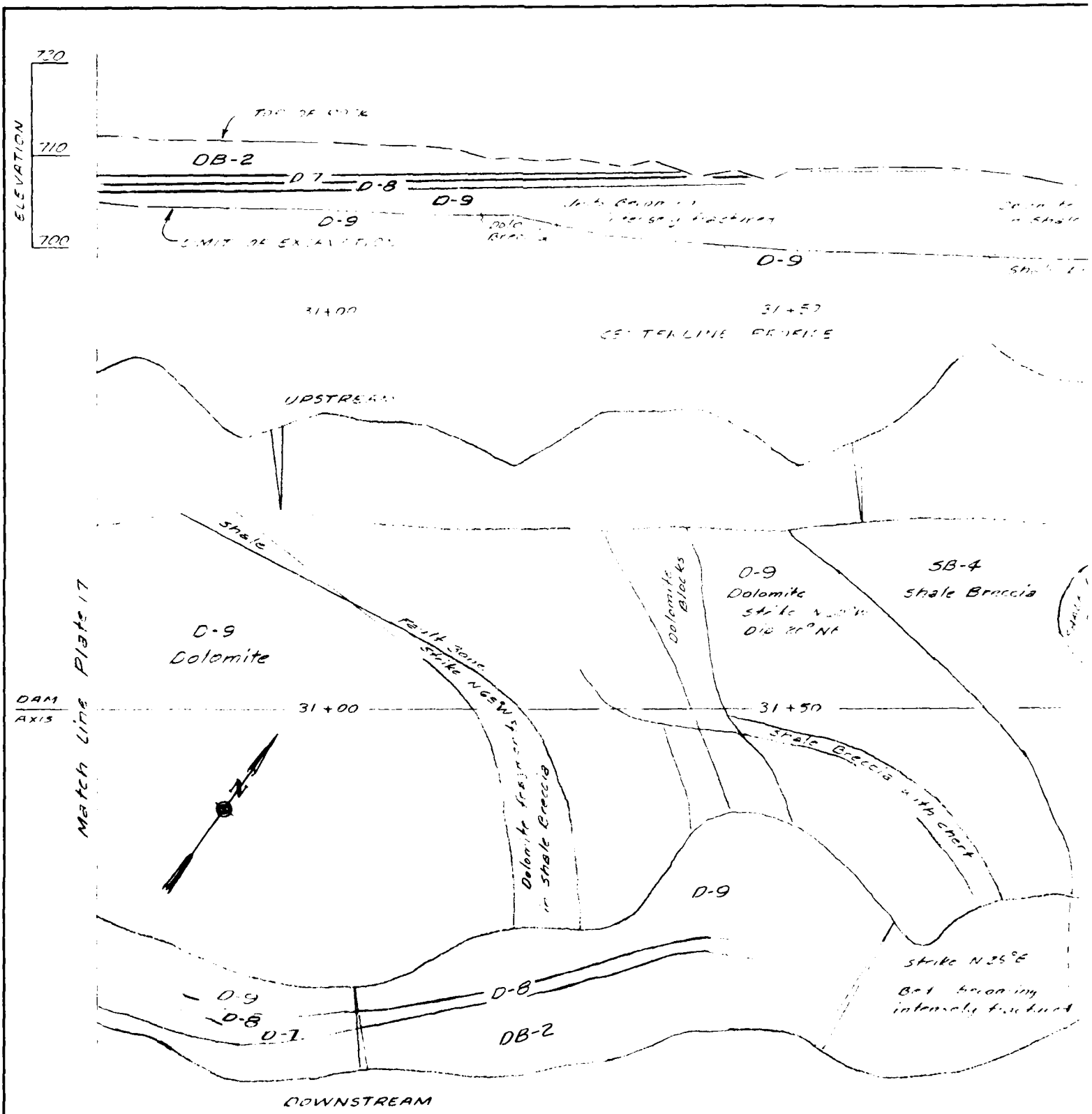
MAP CUTOFF TRENCH
STA. 29+00 TO STA. 30+75
Scale
Date
MARCH 1988
Sheet number
File No. 0-12-9147

PLATE NO. 17



STAGE I

MAP CUTOFF TRENCH STA 30+75 TO

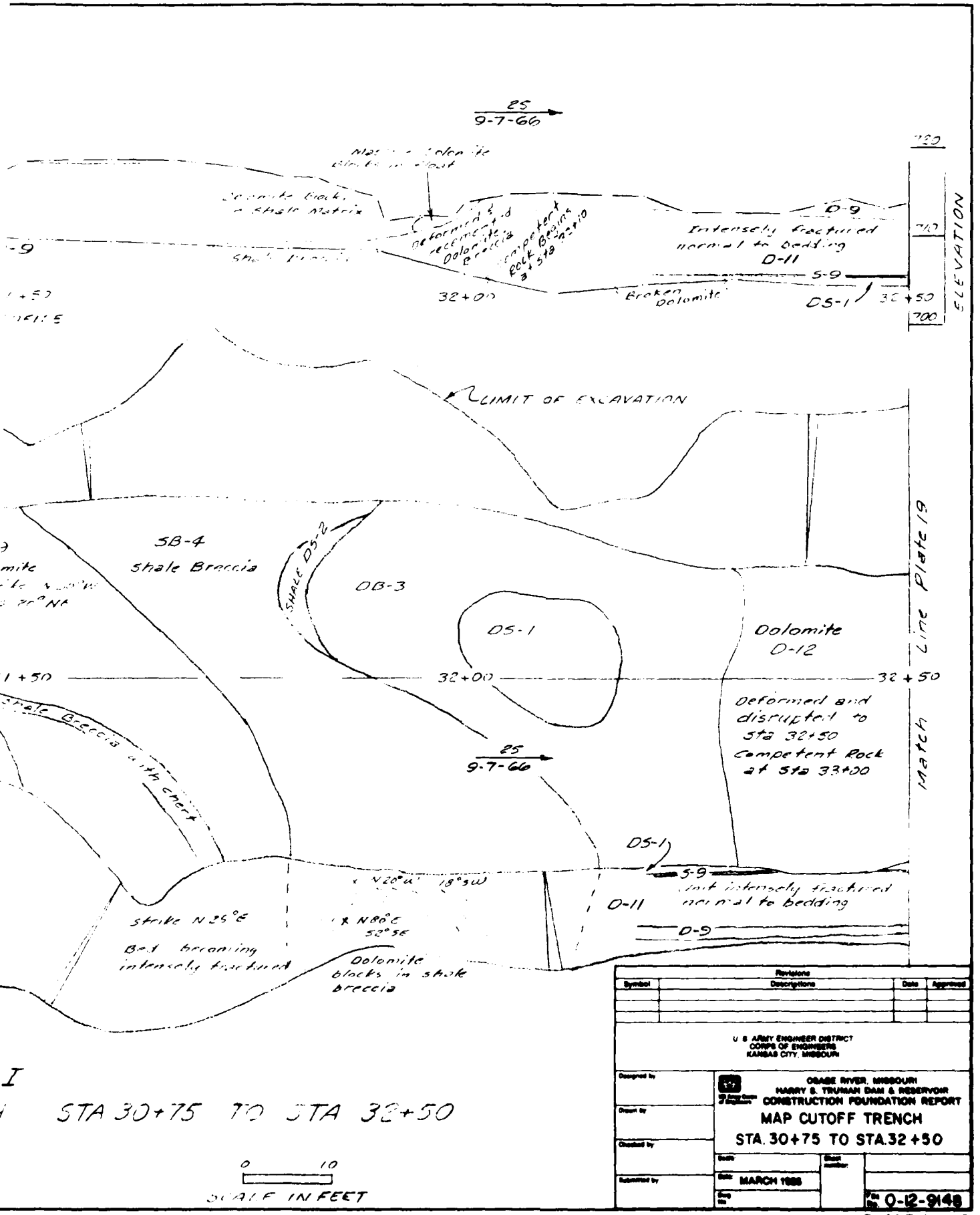
25
9-7-66

Direction Date & Number of Photo

For Legend See Plates 11 & 12

0

SCALE 1



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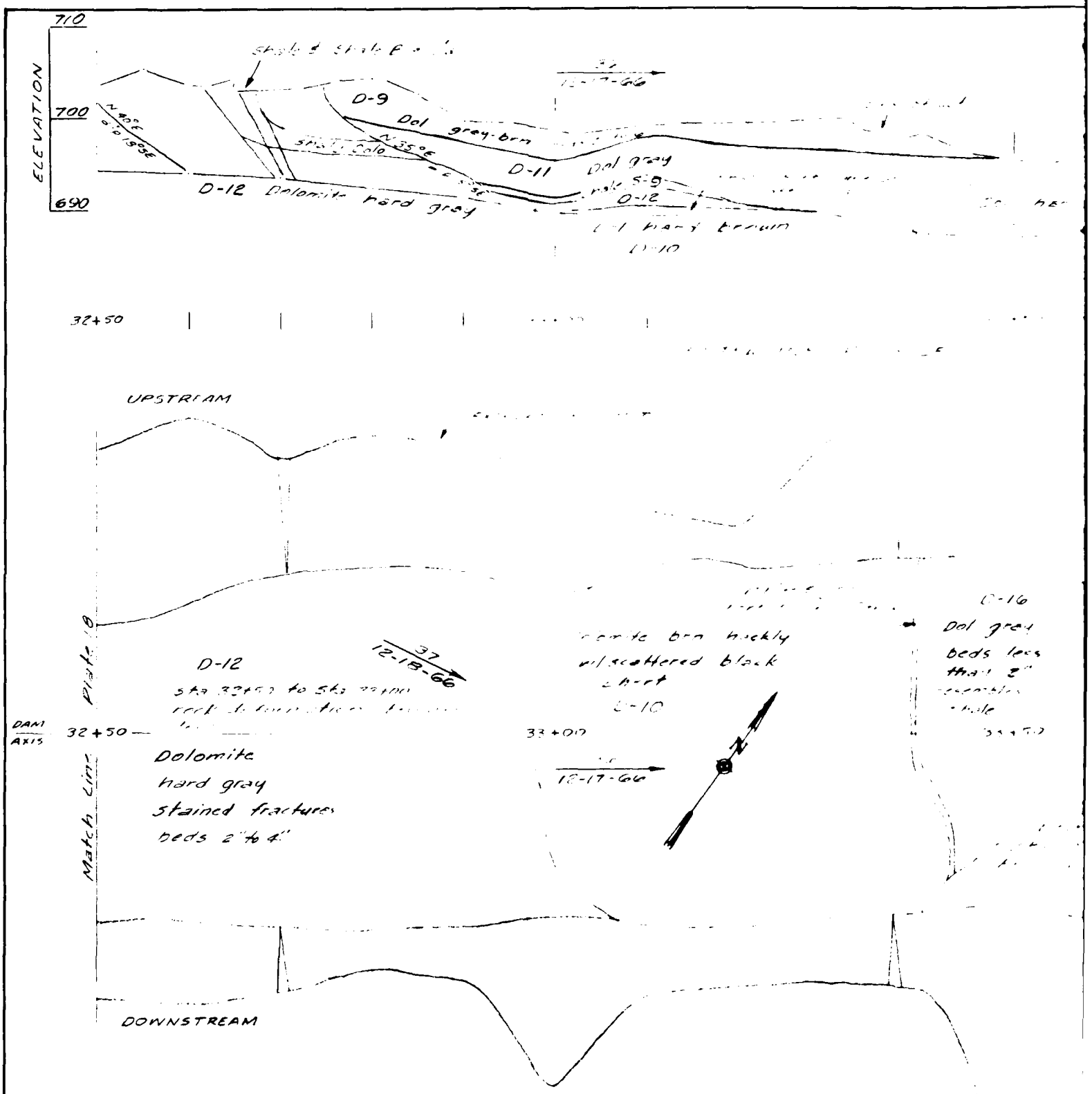
MAP CUTOFF TRENCH
STA. 30+75 TO STA. 32+50

Scale:
Sheet number:
Date: MARCH 1966
File No. 0-12-9148

PLATE NO. 18

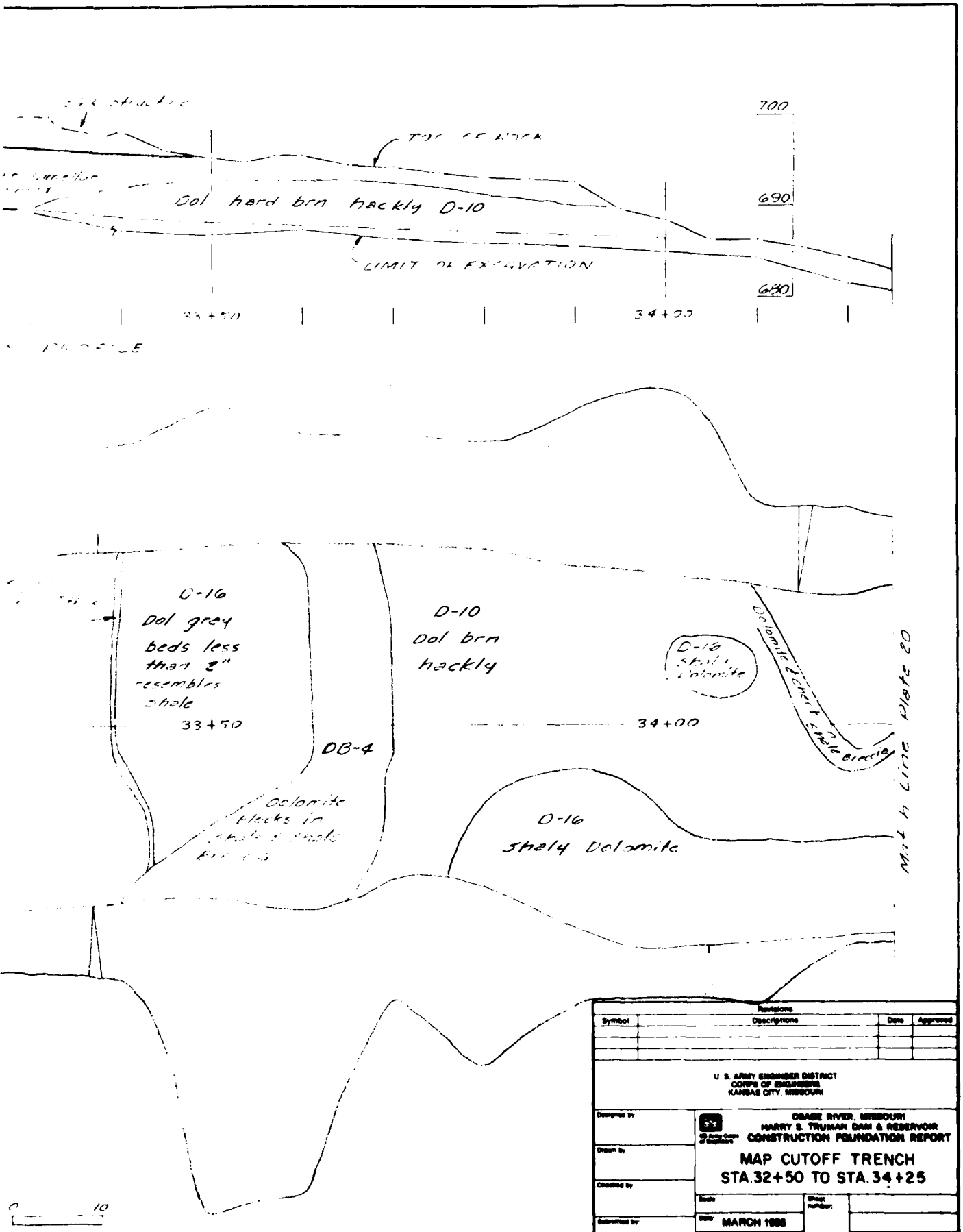


STAGE I MAP CUTOFF TRENCH
STA 32+50 TO STA 34+25

37 / 12-18-66 Direction Date & Number of Photo

For Legend See Plates 11 & 12

0 10
SCALE IN FEET



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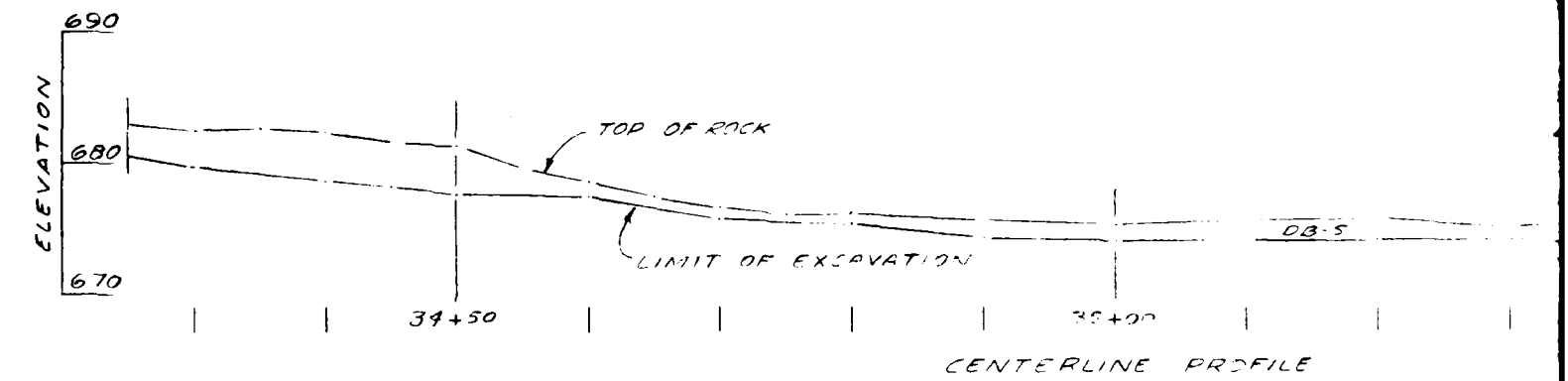
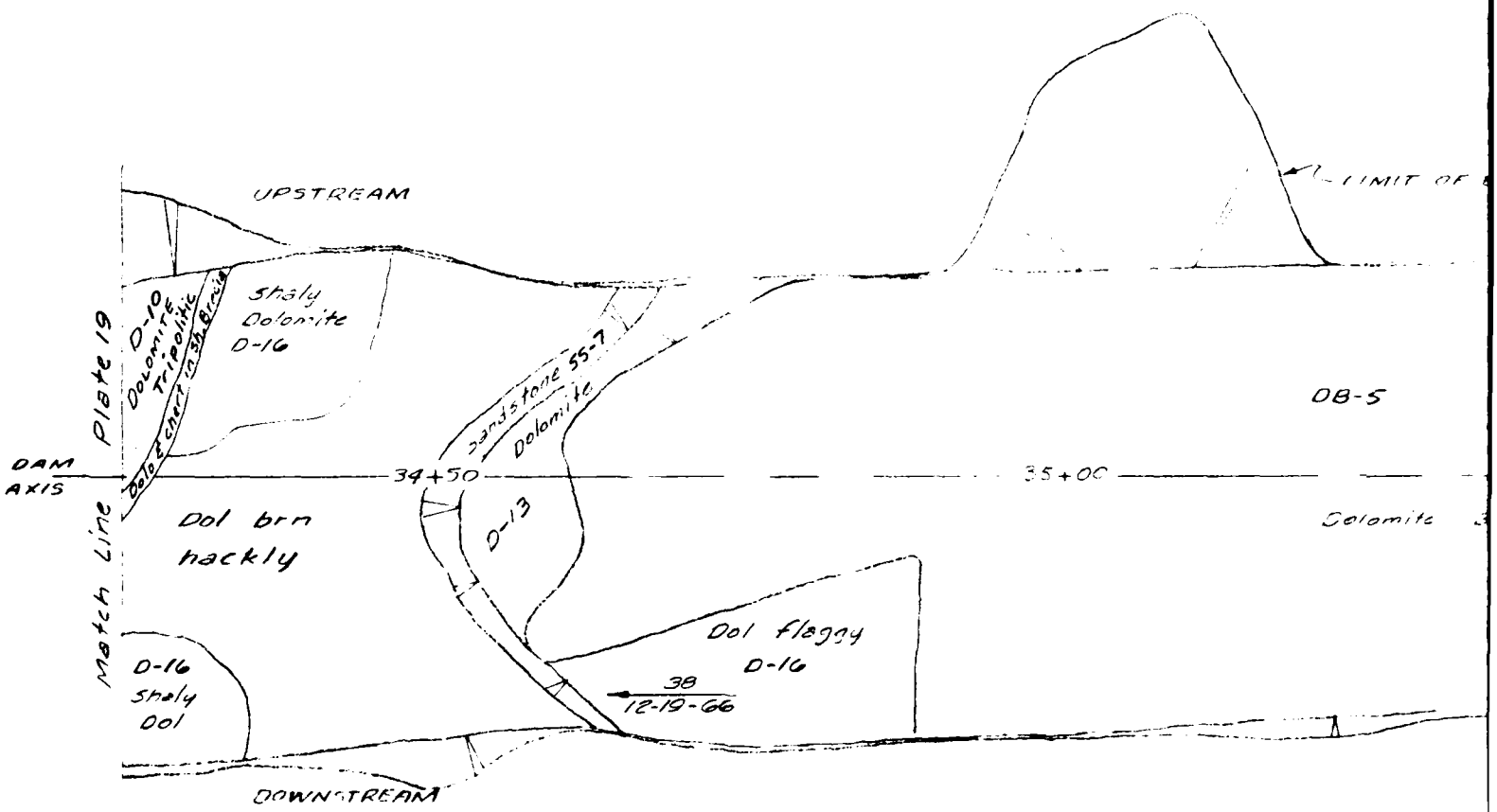
MAP CUTOFF TRENCH
STA.32+50 TO STA.34+25

Scale
Sheet number
Date MARCH 1988
Dwg file
File No. O-12-9149

PLATE NO. 19

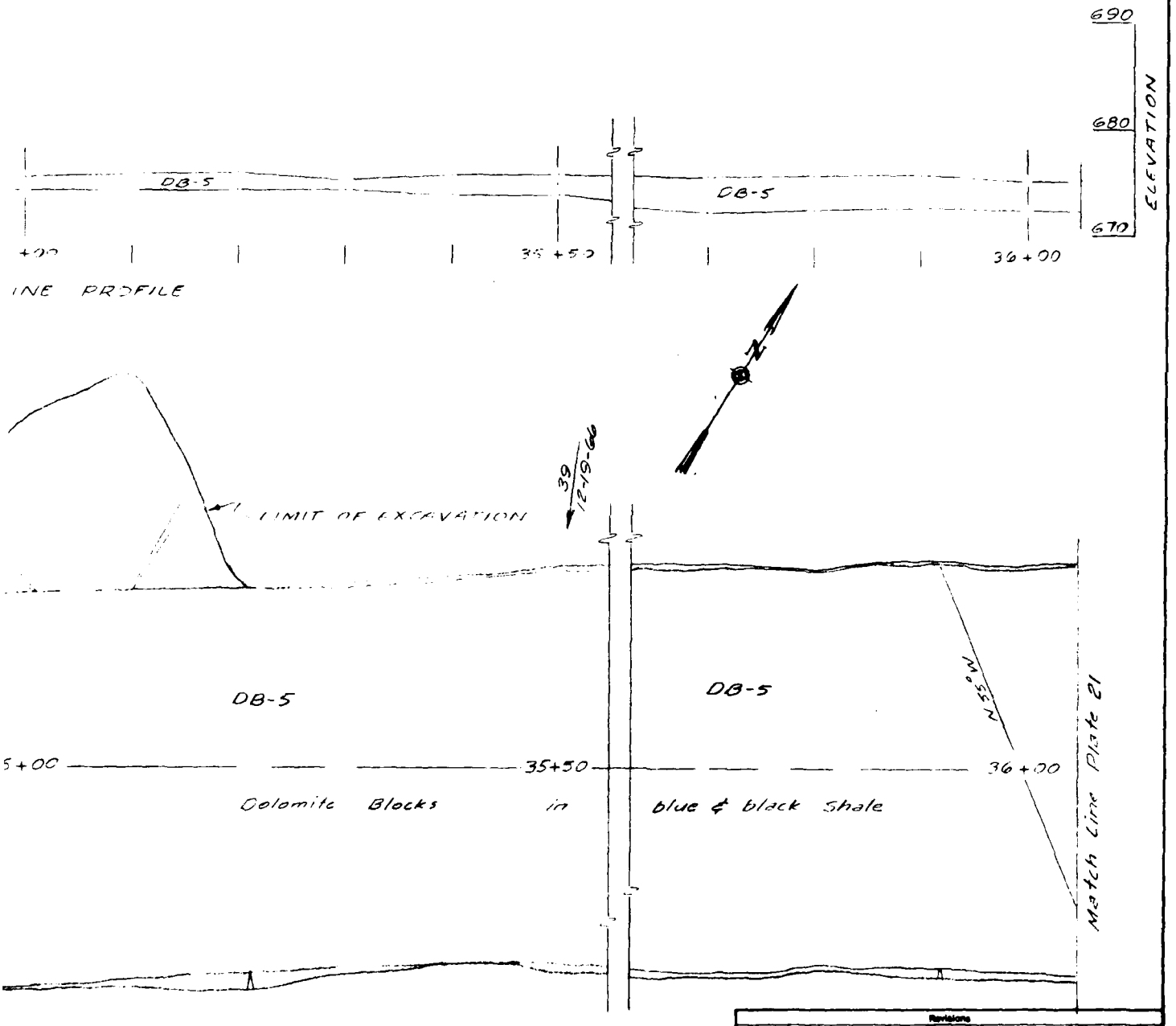




STAGE I MAP CUTOFF TRENCH STA 34+25 TO

38/12-19-66 Direction, Date & Number of Photo

For Legend See Plates 11 & 12



STA 34+25 TO STA 36+05

0 10
SCALE IN FEET

Revisions			
Symbol	Descriptions	Date	Approved

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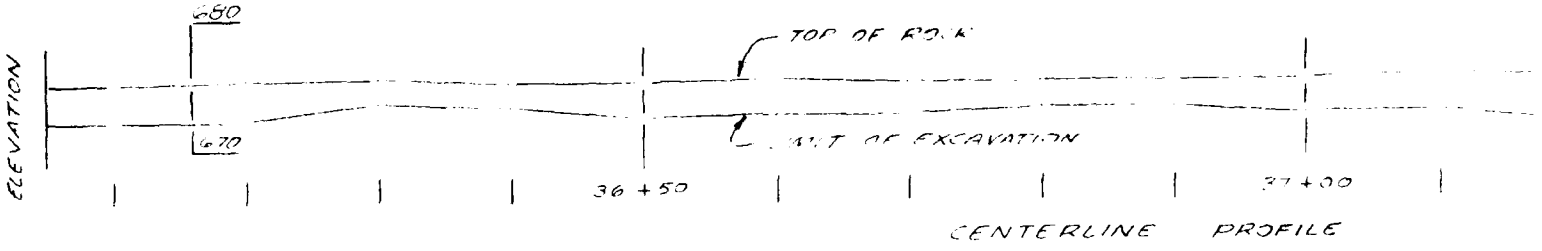
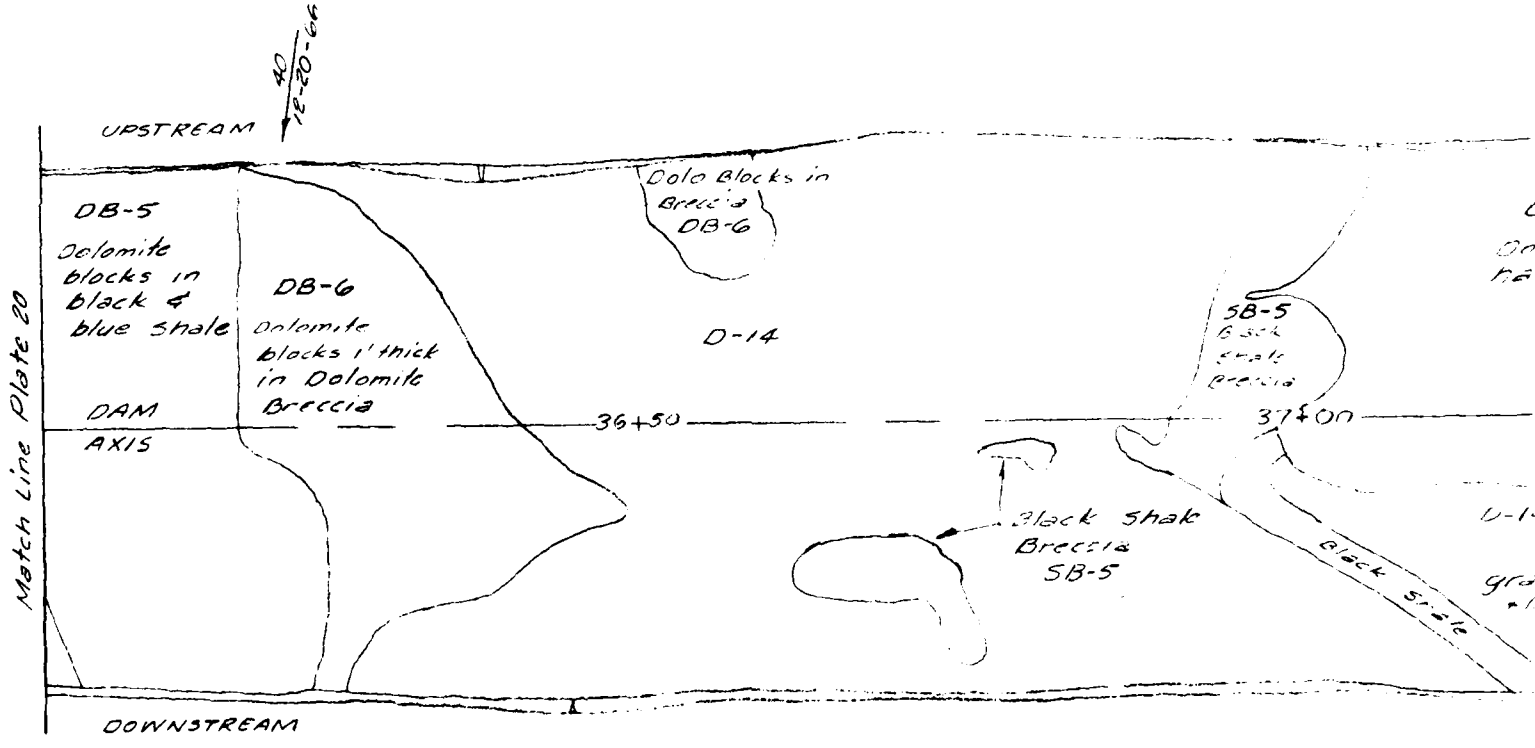
MAP CUTOFF TRENCH
STA.34+25 TO STA.36+05

Scale
Date MARCH 1966
Sheet number
File No. 0-12-9150

PLATE NO. 20





STAGE I MAP CUTOFF TRENCH STA 36+25 TO ST

NOTE

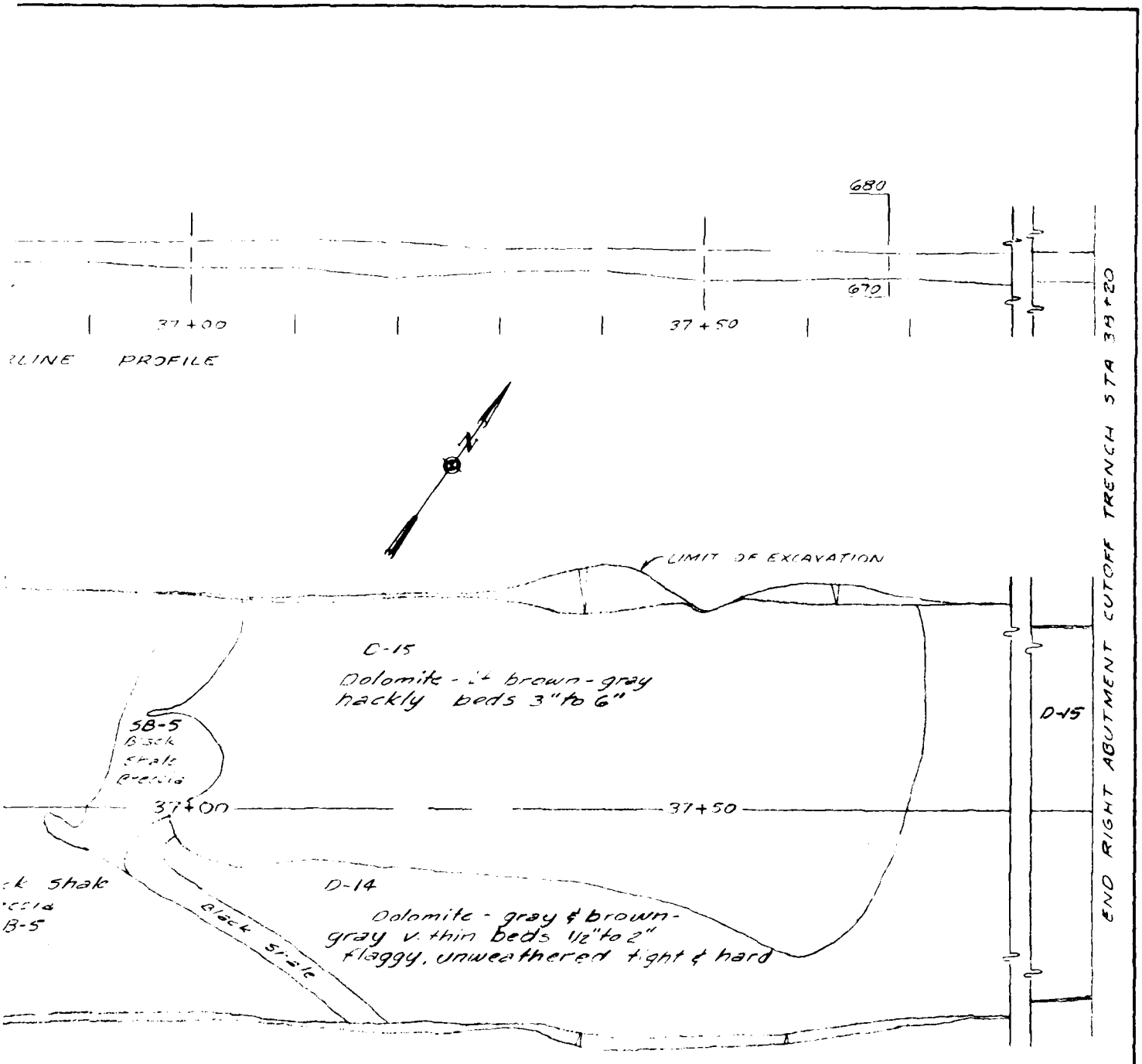
From Sta 36+20 to Sta 48+30 see Spillway Excavation Plates 62 thru 71

40
12-20-66
Direction Date & Number of Photo

For Legend See Plates 11 & 12

0

SCALE IN FE



H STA 36+05 TO STA 38+20

20 to Sta 48+30 see Spillway-Powerhouse
Plates 62 thru 71

0 10
SCALE IN FEET

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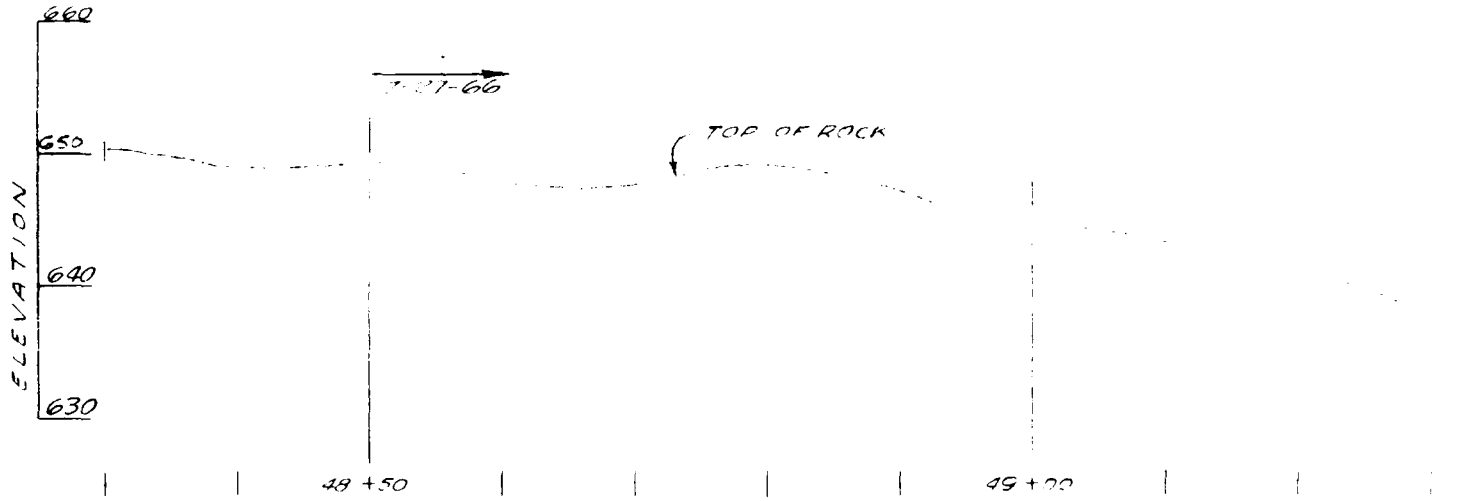
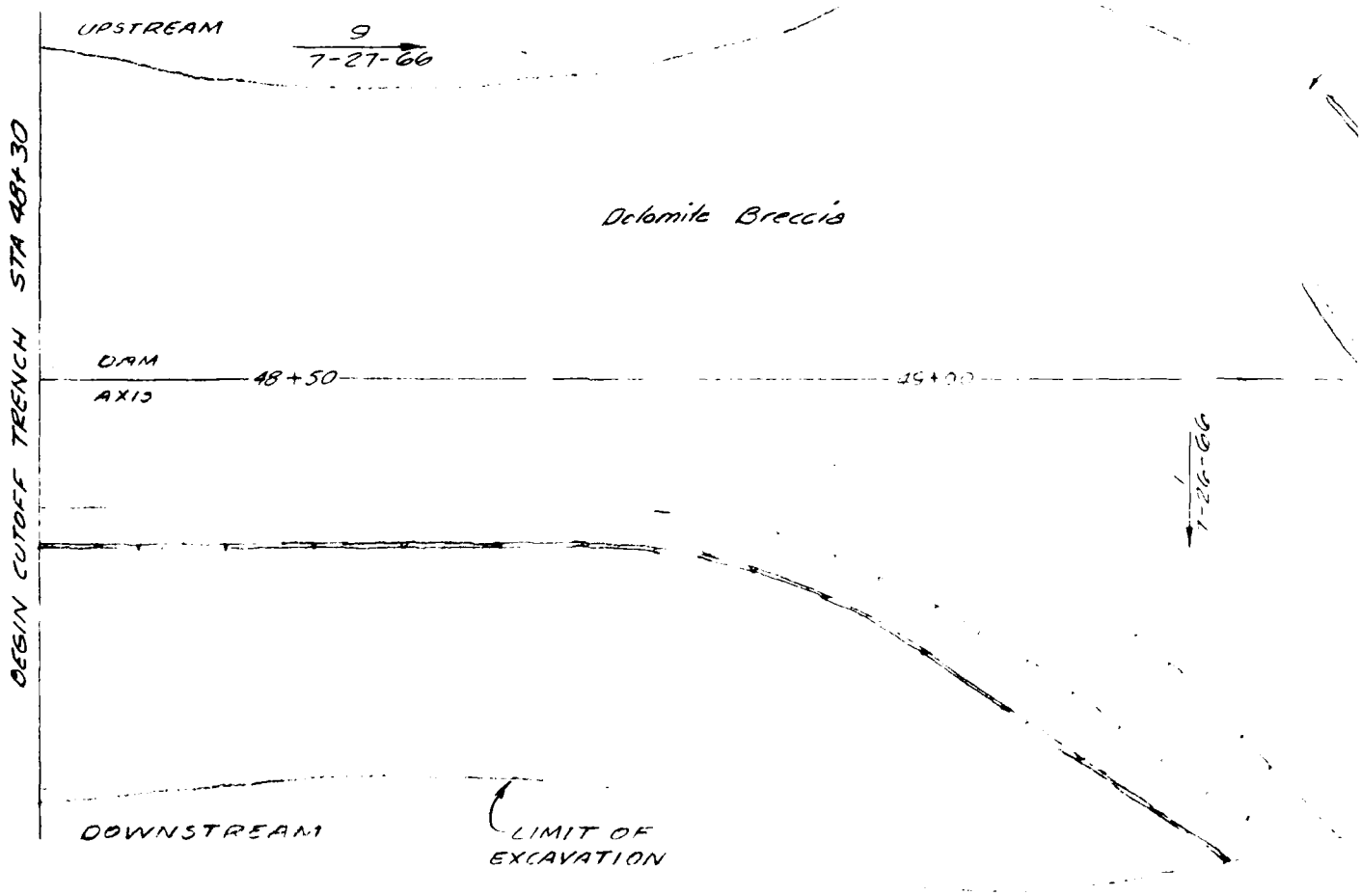
MAP CUTOFF TRENCH
STA. 36+05 TO STA. 38+20

Scale
Sheet number
Date MARCH 1966
File No. 0-12-9151

PLATE NO. 21



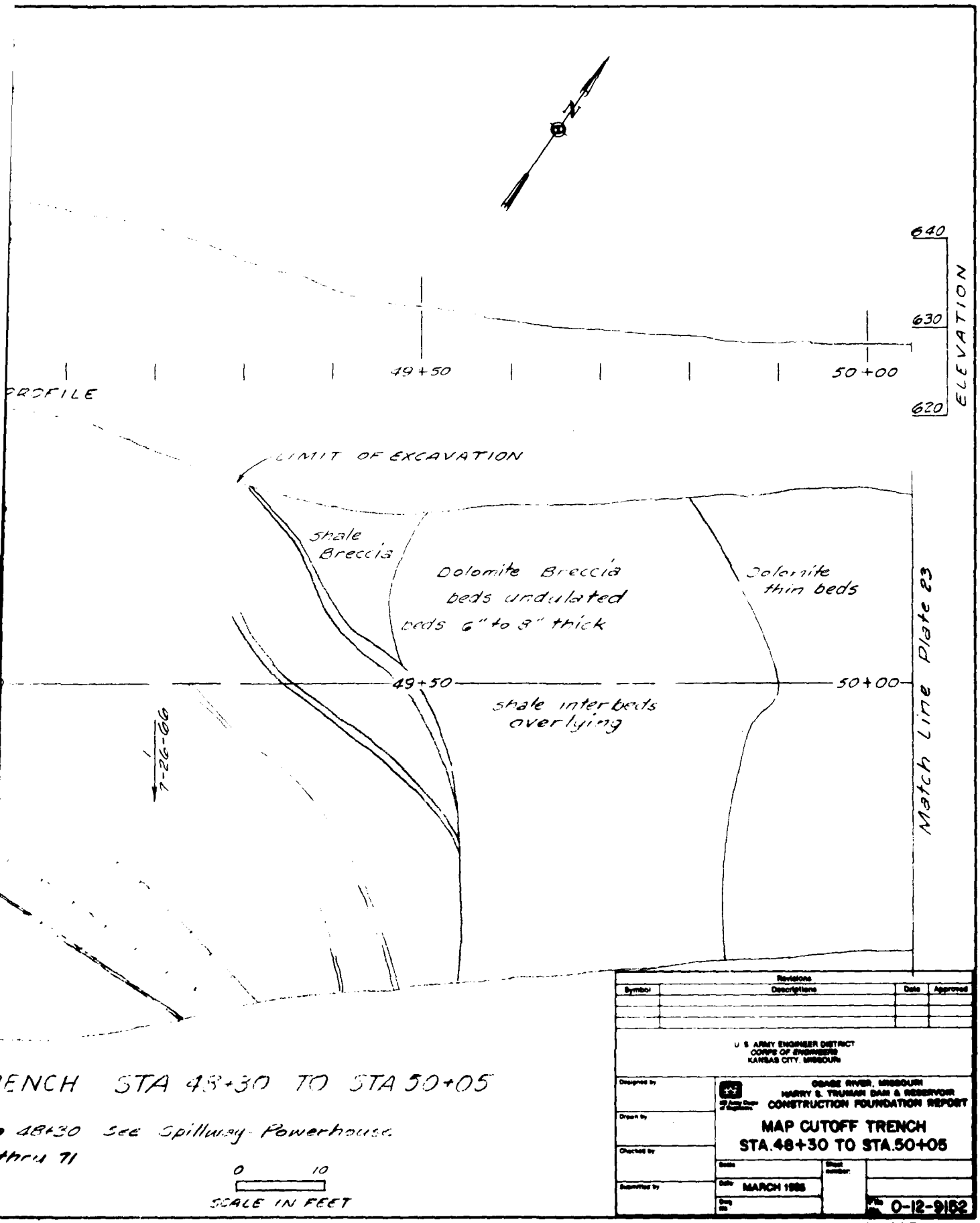


STAGE I MAP CUTOFF TRENCH STA 48+30

NOTE
From Sta 38+20 to Sta 48+30 See Spillway Excavation Notes 62 thru 71

Direction Date & Number of Photo

0
SCALE


N
640
630
620
ELEVATION
49+50
50+00
PROFILE
LIMIT OF EXCAVATION
Shale Breccia
Dolomite Breccia beds undulated beds 6" to 9" thick
Dolomite thin beds
49+50
50+00
Shale interbeds overlying
7-26-66
Match Line Plate 23
TRENCH STA 48+30 TO STA 50+05
48+30 See Spillway-Powerhouse
thru 71
0 10
SCALE IN FEET
Revisions
Symbol
Descriptions
Date
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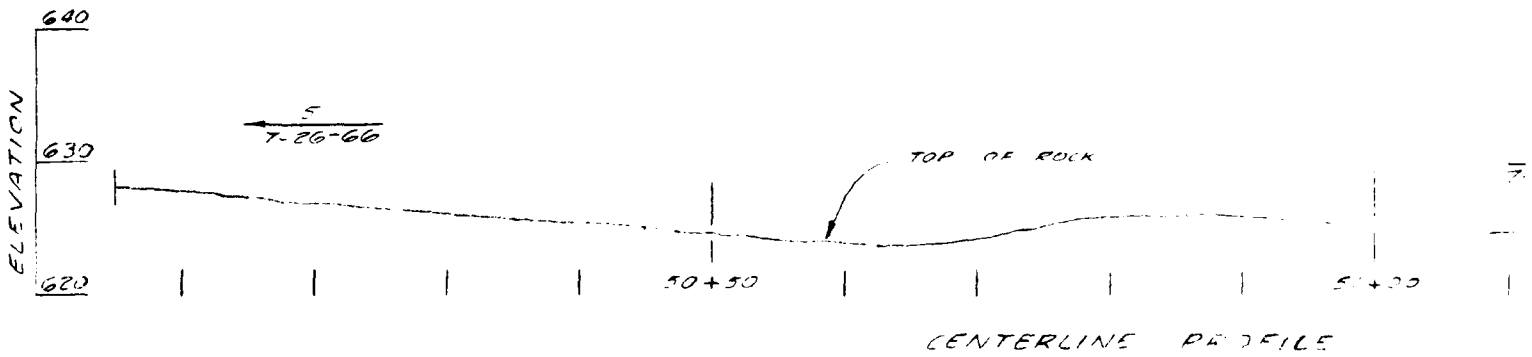
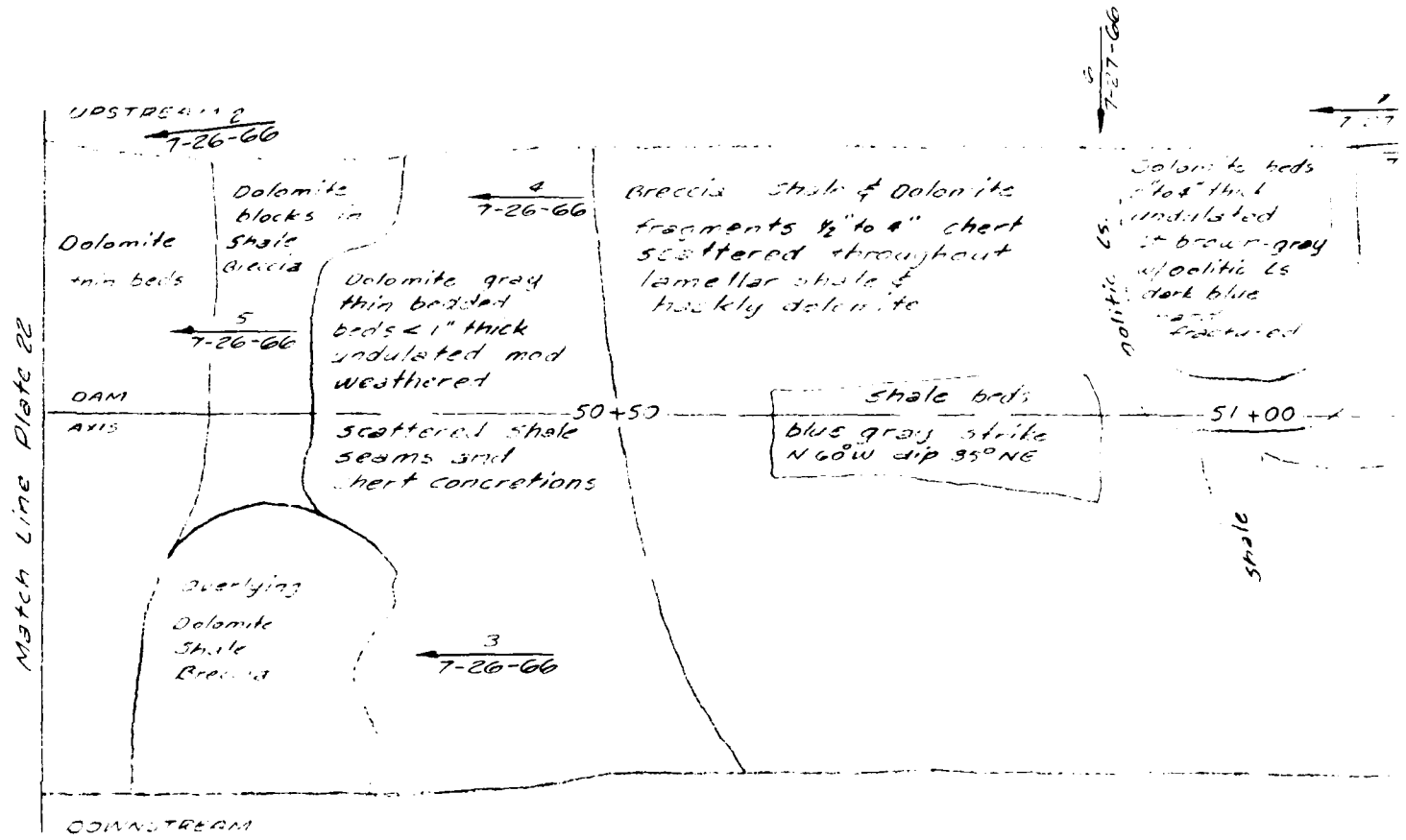
MAP CUTOFF TRENCH
STA.48+30 TO STA.50+05
Scale
Sheet number
Date MARCH 1966
File No. 0-12-9152

PLATE NO. 22

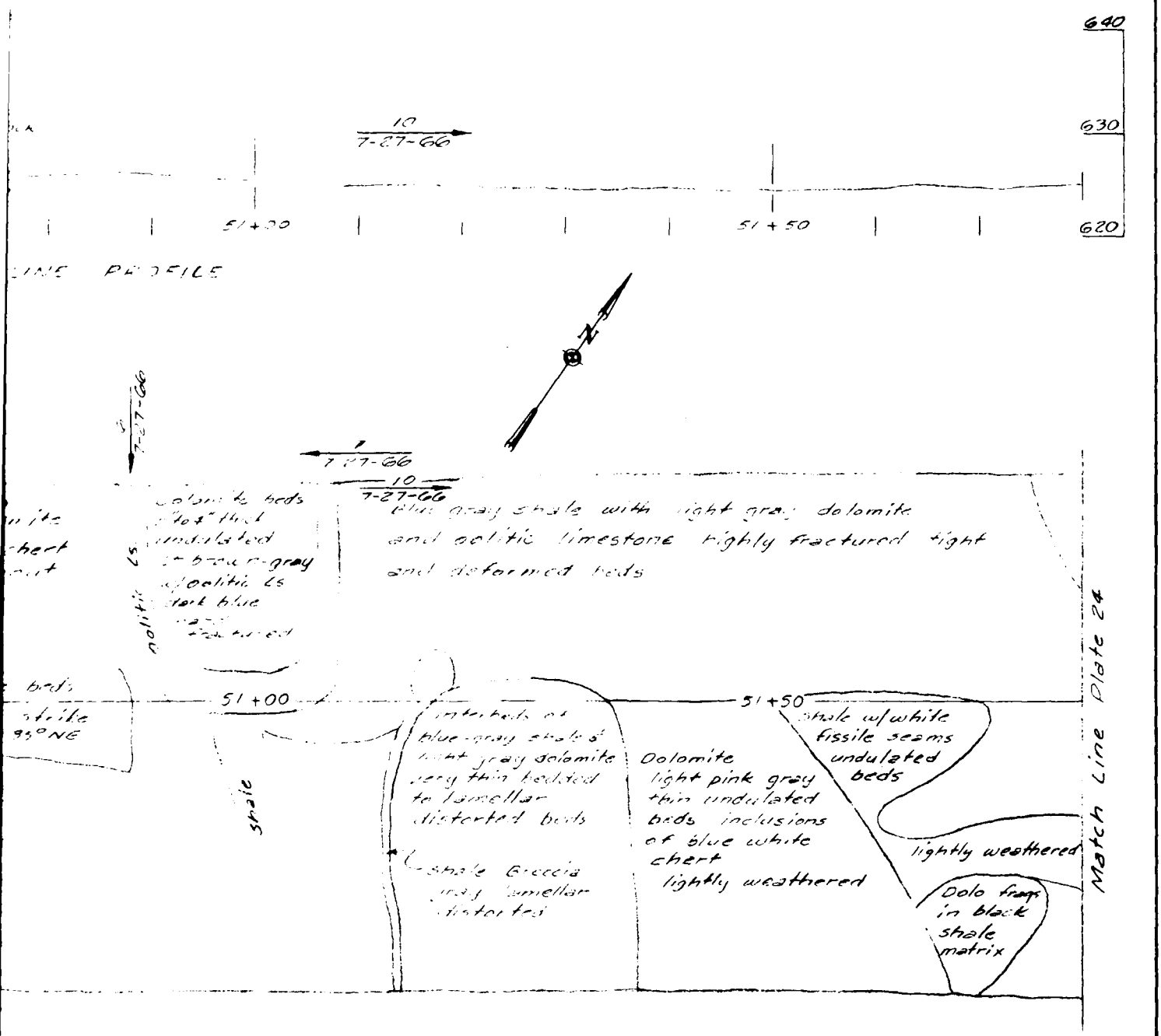




STAGE I MAP CUTOFF TRENCH STA 50+05 TO

5
7-26-66
Direction Number &
Date of Photo

SCALE IN



CH STA 50+05 TO STA 51+80

0 10
SCALE IN FEET

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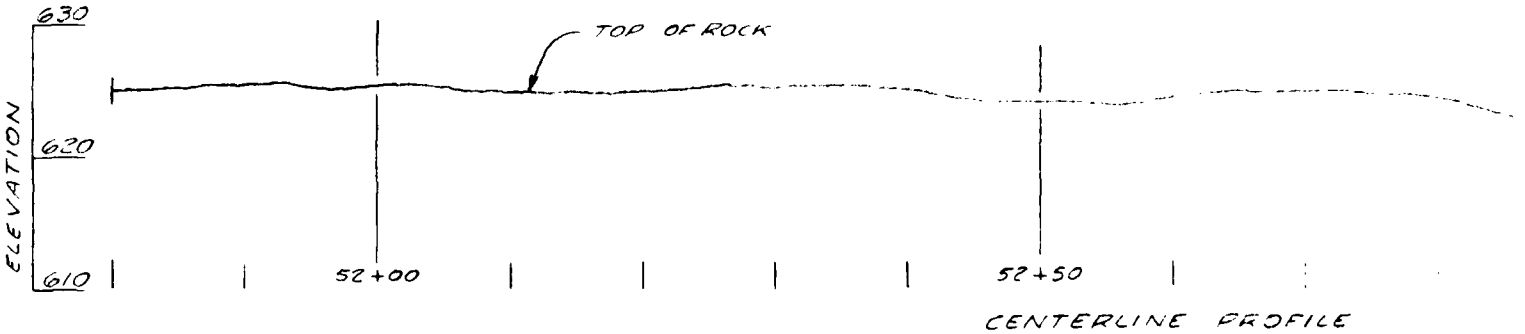
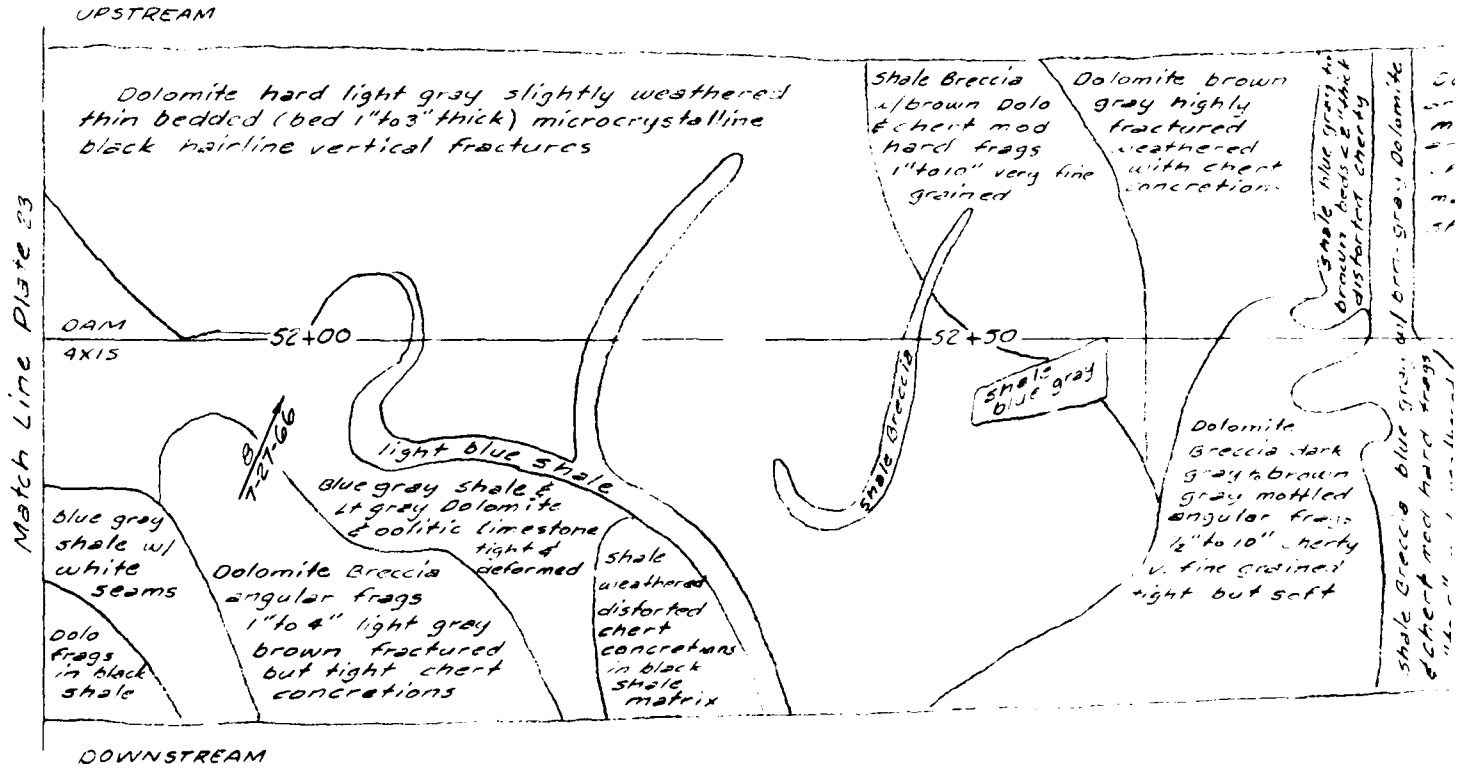
MAP CUTOFF TRENCH
STA. 50+05 TO STA. 51+80

Date: MARCH 1966
Sheet number:
Dwg No.
File No. 0-12-9183

PLATE NO. 23

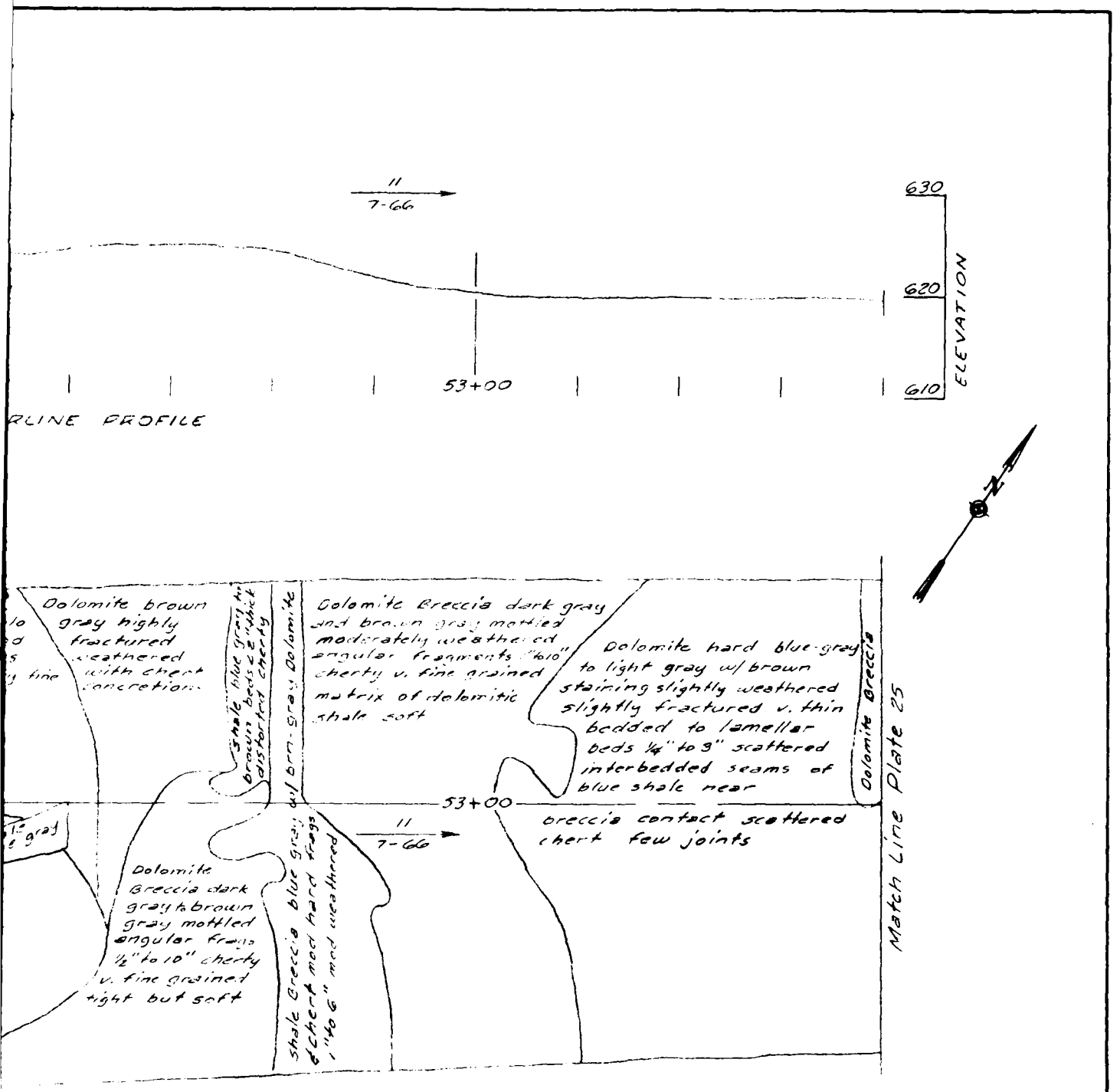




STAGE I MAP CUTOFF TRENCH STA 51+80 TO 5

Direction Number & Date of Photo

SCALE IN



TH STA 51+80 TO STA 53+40

0 10
SCALE IN FEET

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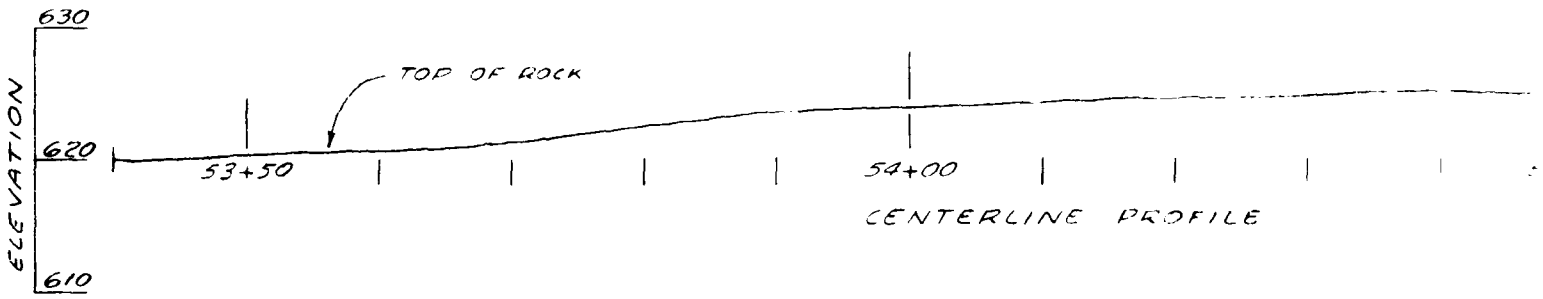
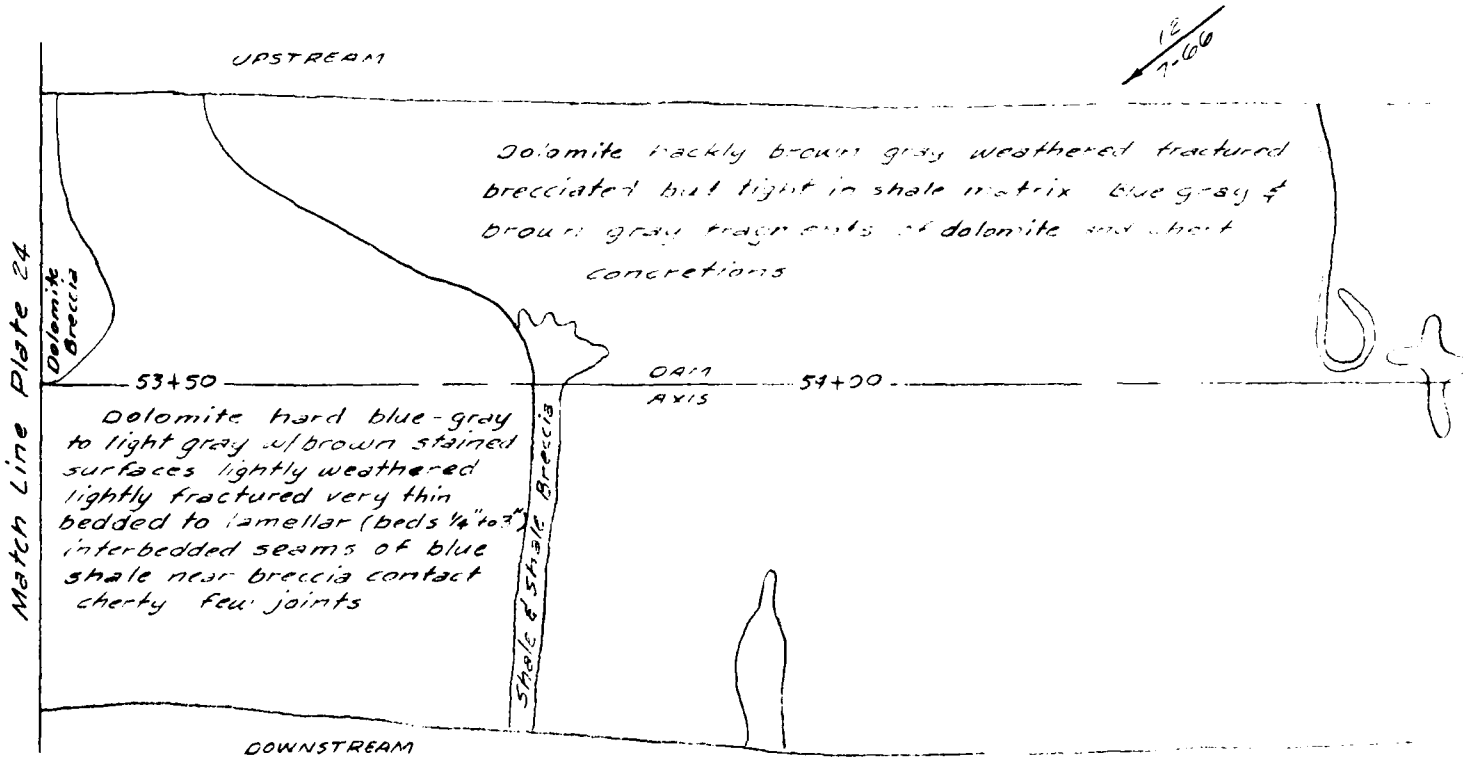
MAP CUTOFF TRENCH
STA. 51+80 TO STA. 53+40

Scale:
Date: MARCH 1966
Sheet number:
Sheet No.:
File No. 0-12-9164

PLATE NO. 24

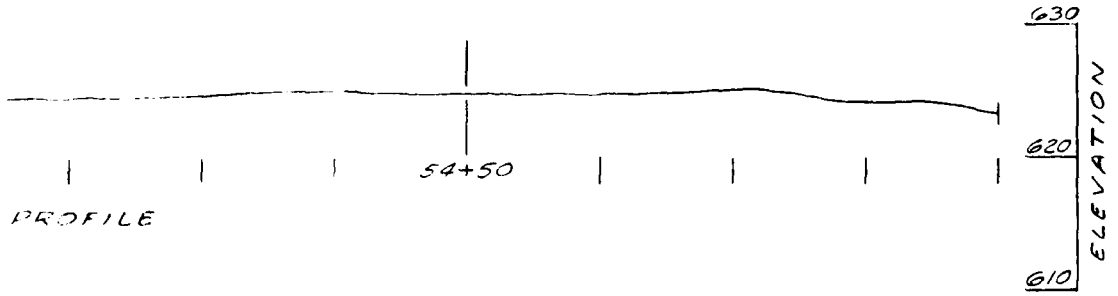


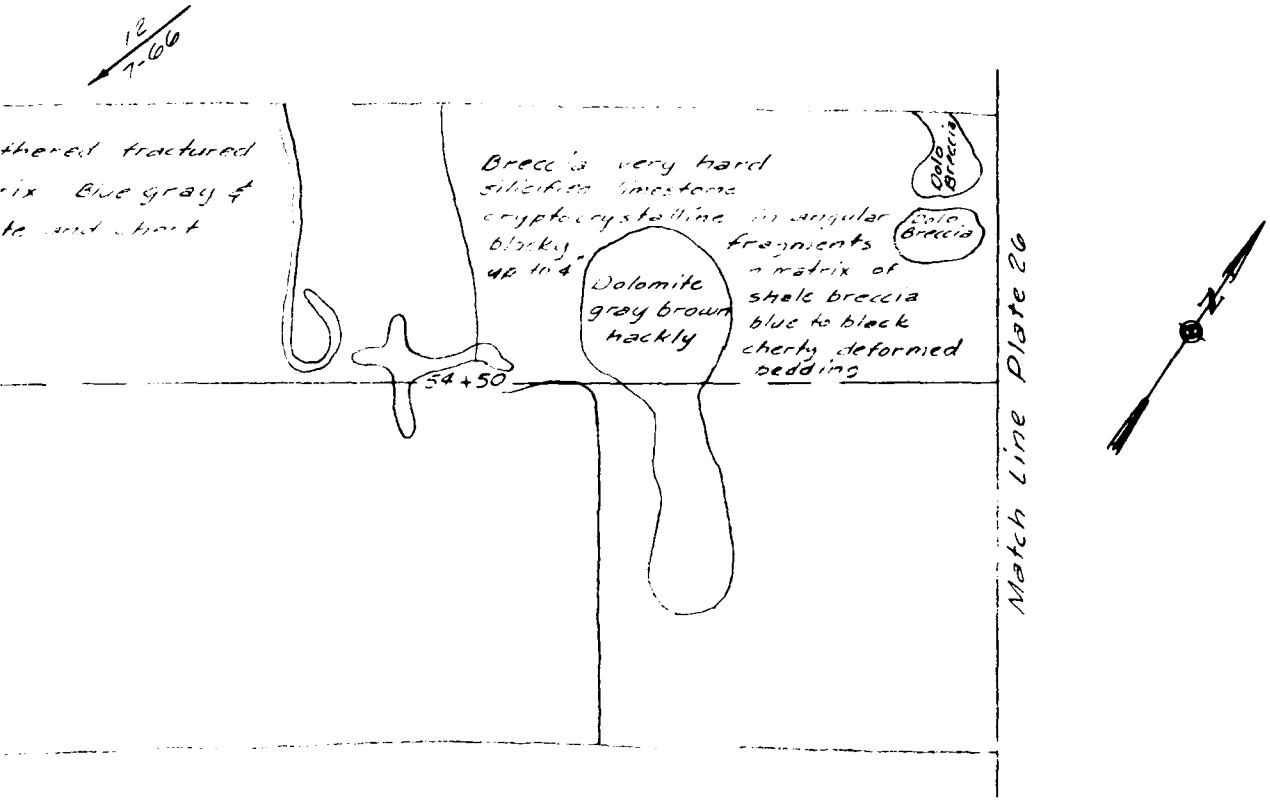


STAGE I MAP CUTOFF TRENCH STA 53+40 TO 5

12
7-66 Direction Number & Date of Photo

0
SCALE IN





STA 53+40 TO STA 54+90

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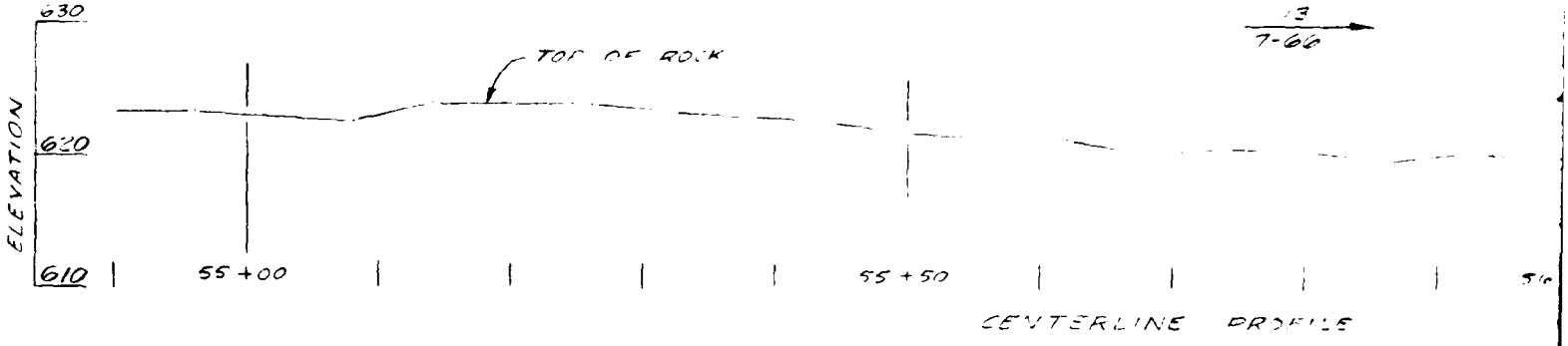
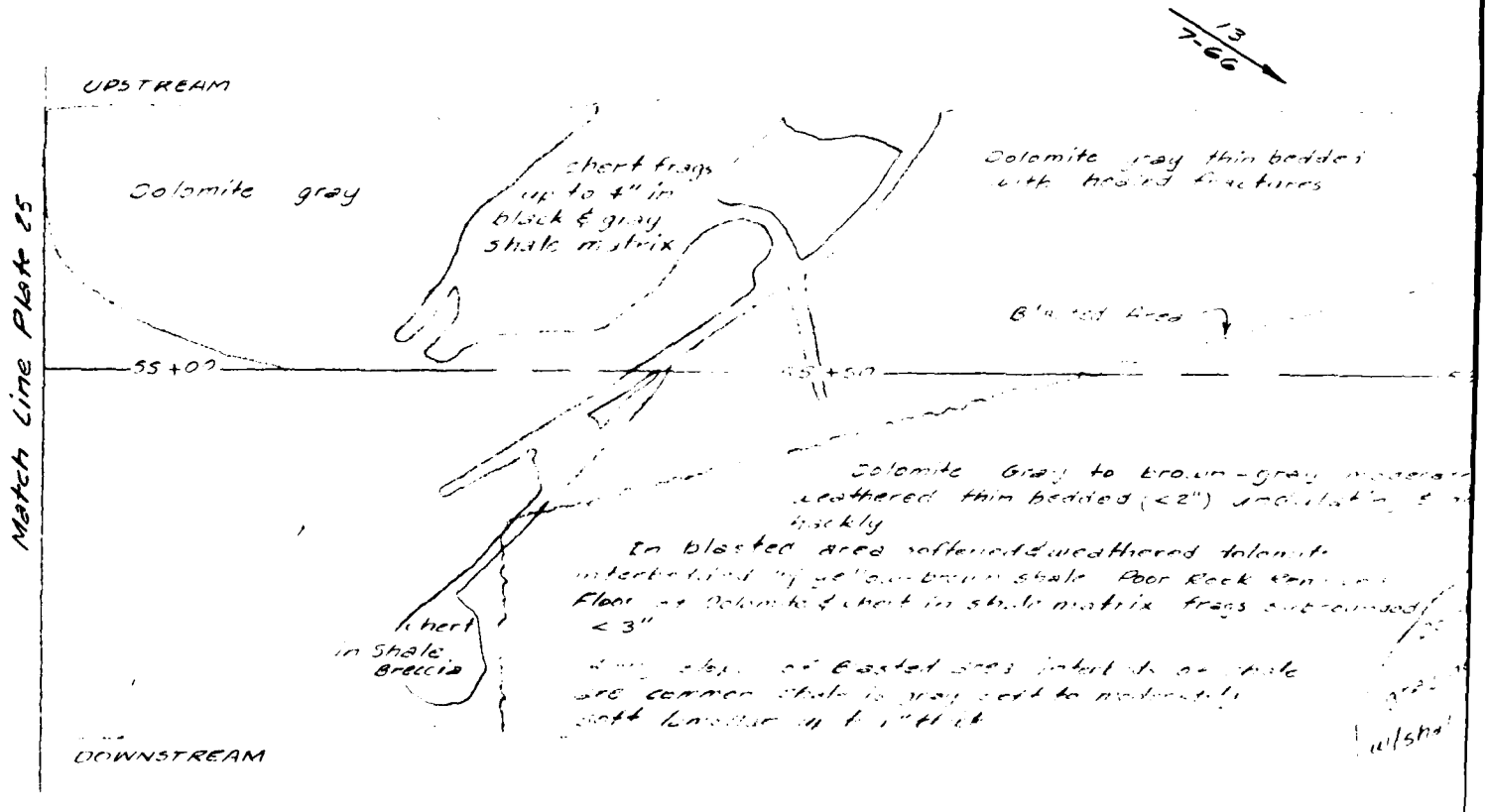
MAP CUTOFF TRENCH
STA.53+40 TO STA.54+90

Scale
Date MARCH 1966
Sheet number
Drawing No. 0-12-9155

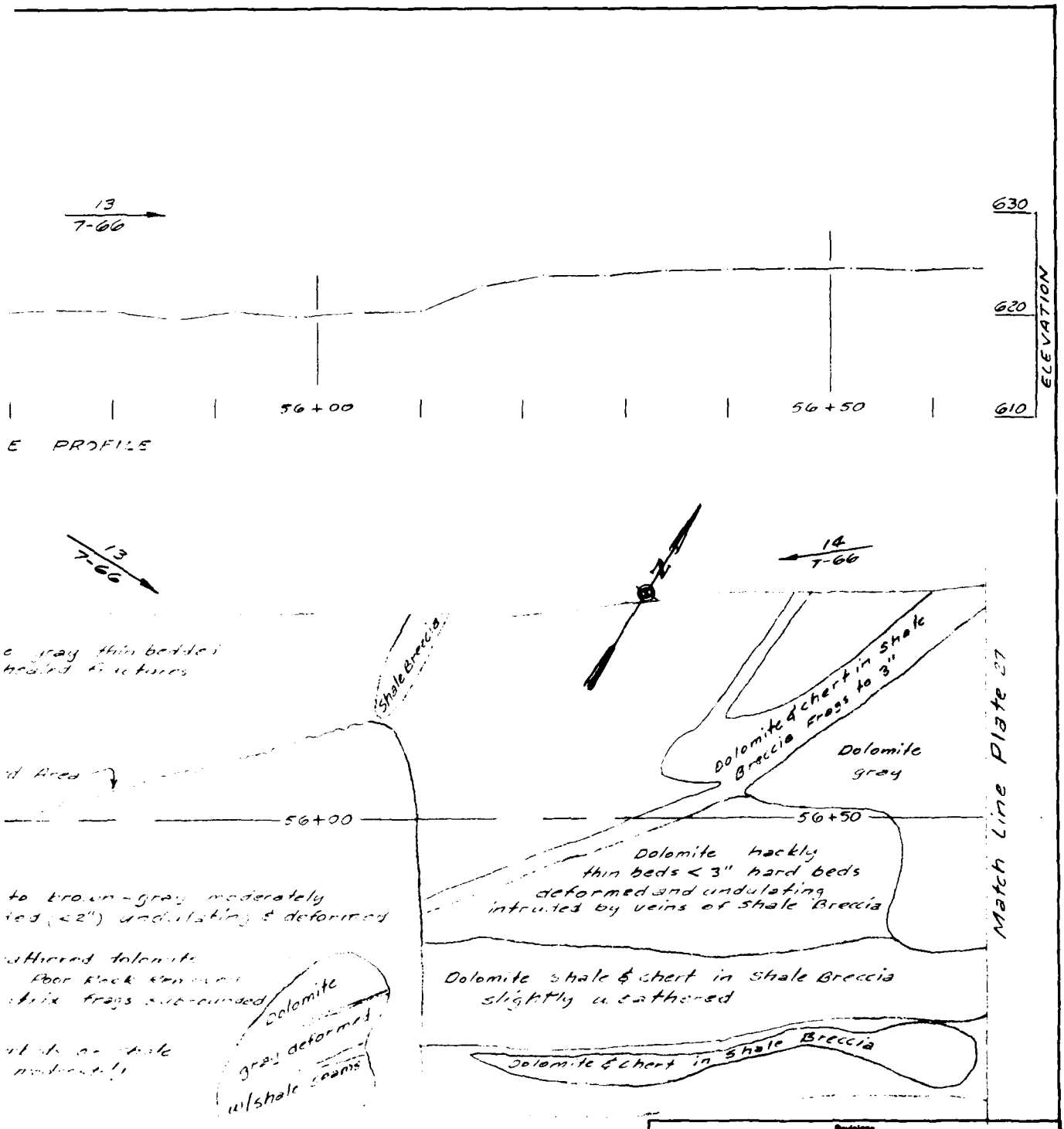
PLATE NO. 25





STAGE I MAP CUTOFF TRENCH STA 54+90 TO 5

13/7-66 Direction Date & Number of Photo



STA 54+90 TO STA 56+65

0 10
SCALE IN FEET

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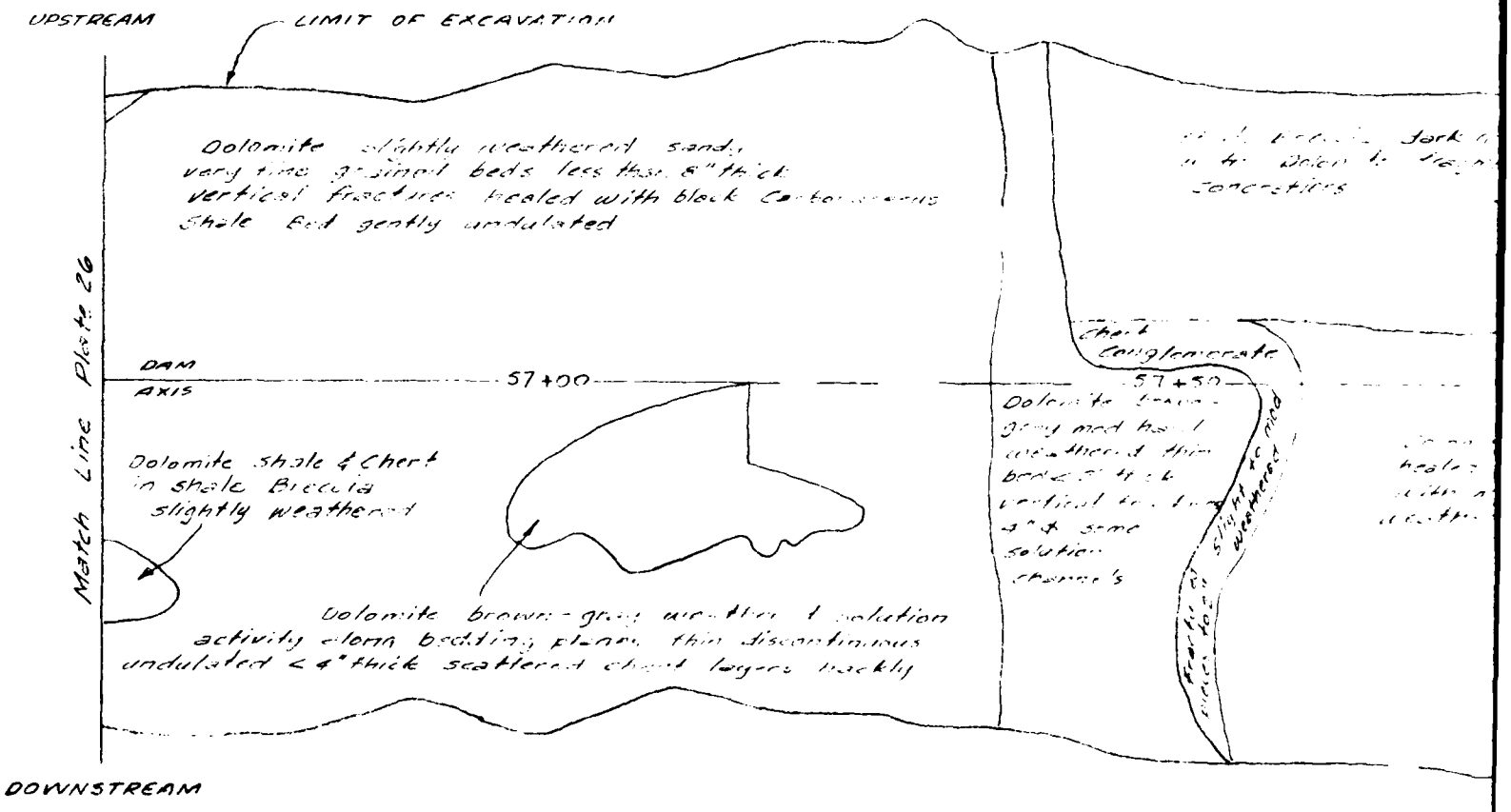
MAP CUTOFF TRENCH
STA.54+90 TO STA.56+65

Scale
Sheet number
Date: MARCH 1966
Date file
File No. 0-12-9156

PLATE NO. 26

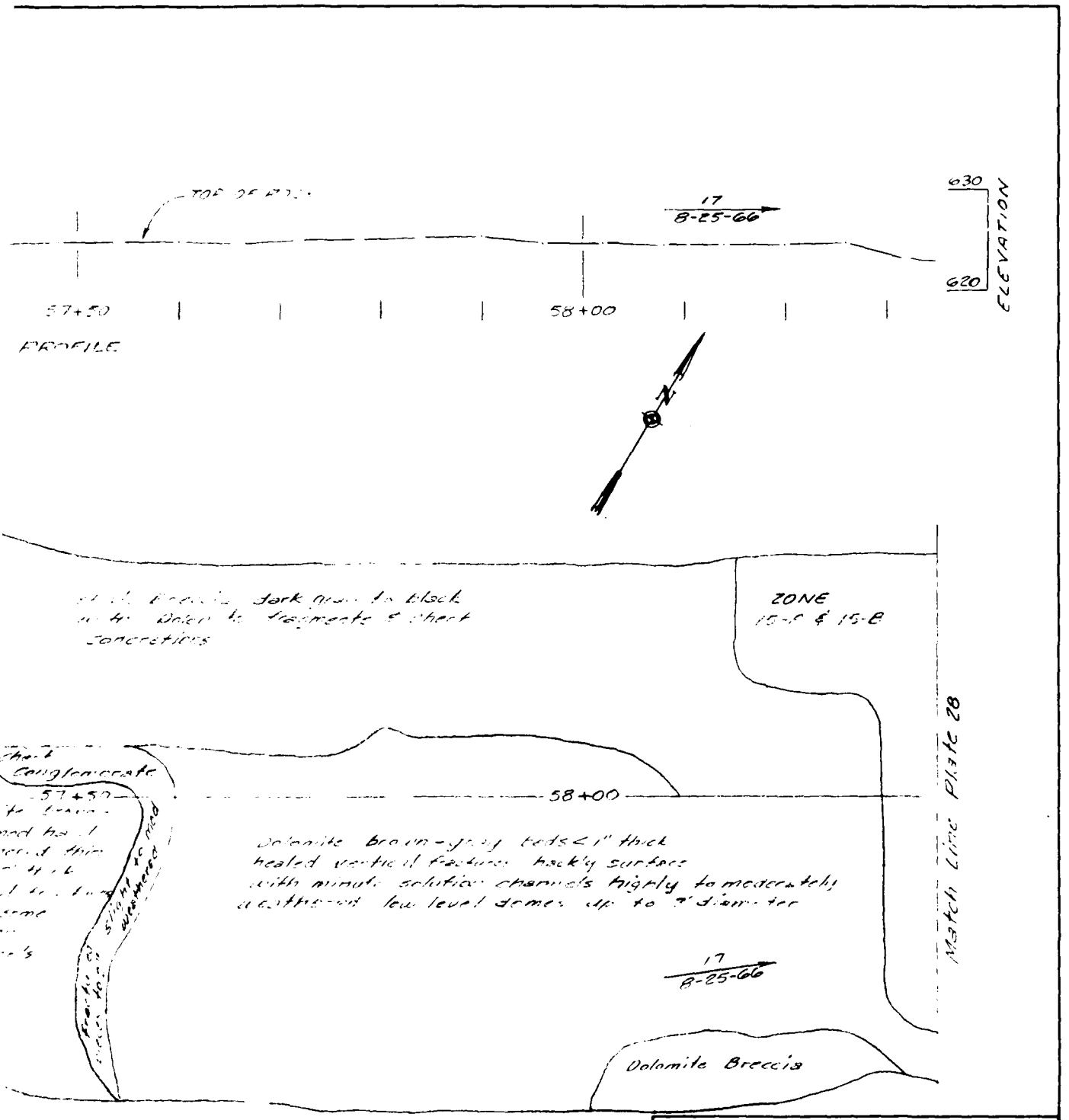


STAGE I MAP CUTOFF TRENCH STA 56+65 TO

For Detail Description of Sec
& Plates 59, 60 & 61

17
8-25-66

Direction Number & Date of Photo



STA 56+65 TO STA 58+35

Detail Description of Geologic Units see Plate 4 & Plates 59, 60 & 61

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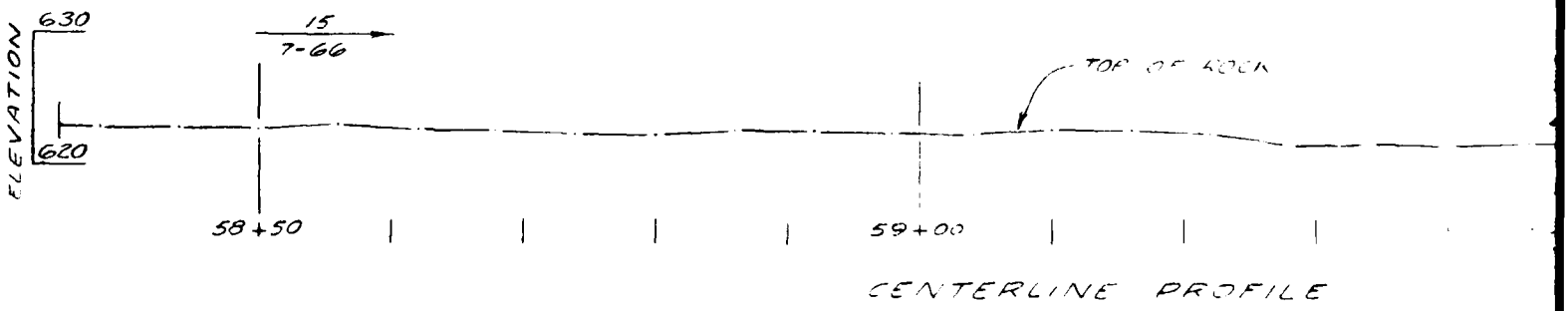
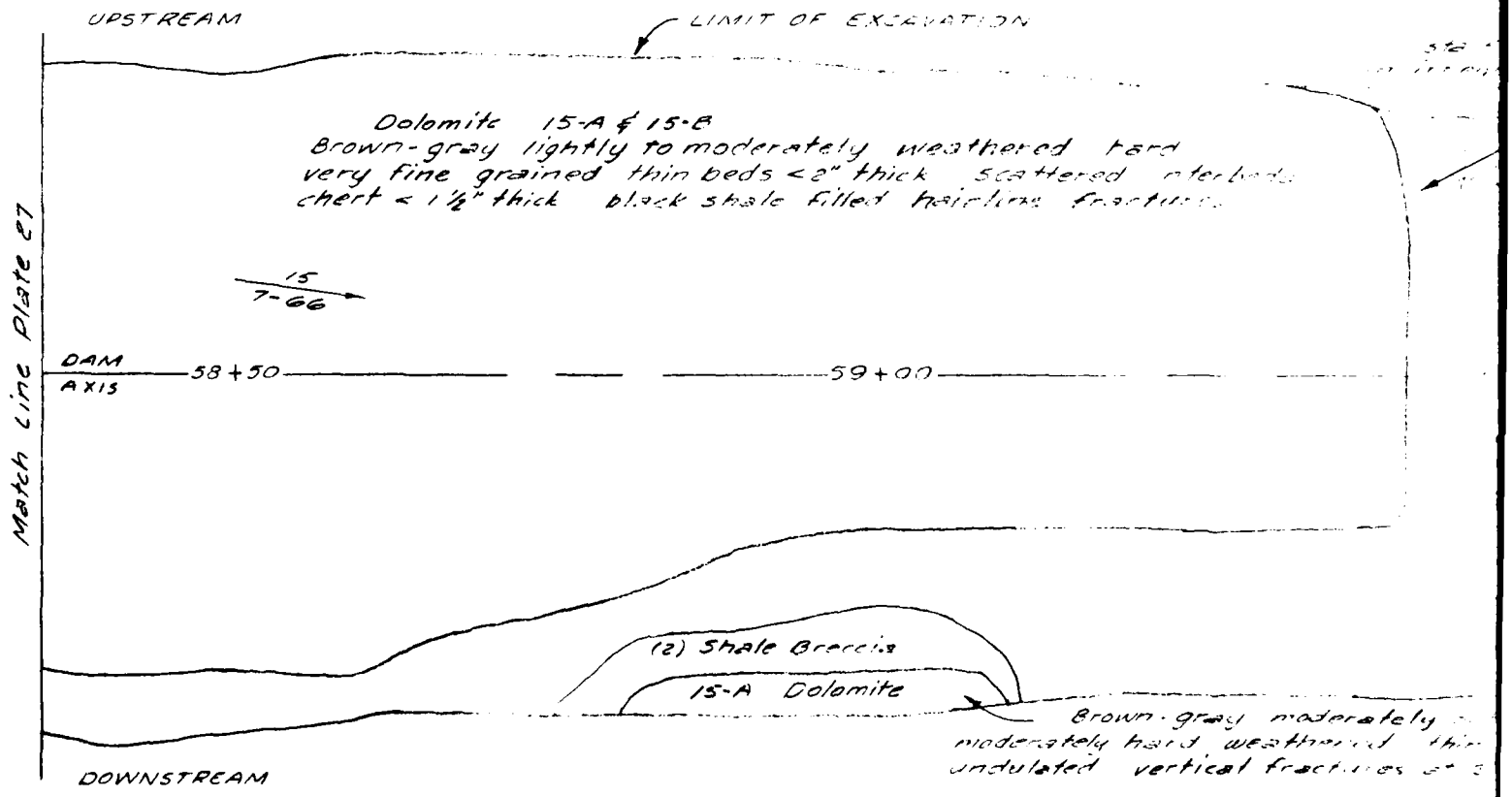
MAP CUTOFF TRENCH
STA. 56+65 TO STA. 58+35

Scale
Date: MARCH 1966
Dwg. No.
Sheet number
File No. 0-12-9157

PLATE NO. 27



CENTERLINE PROFILE

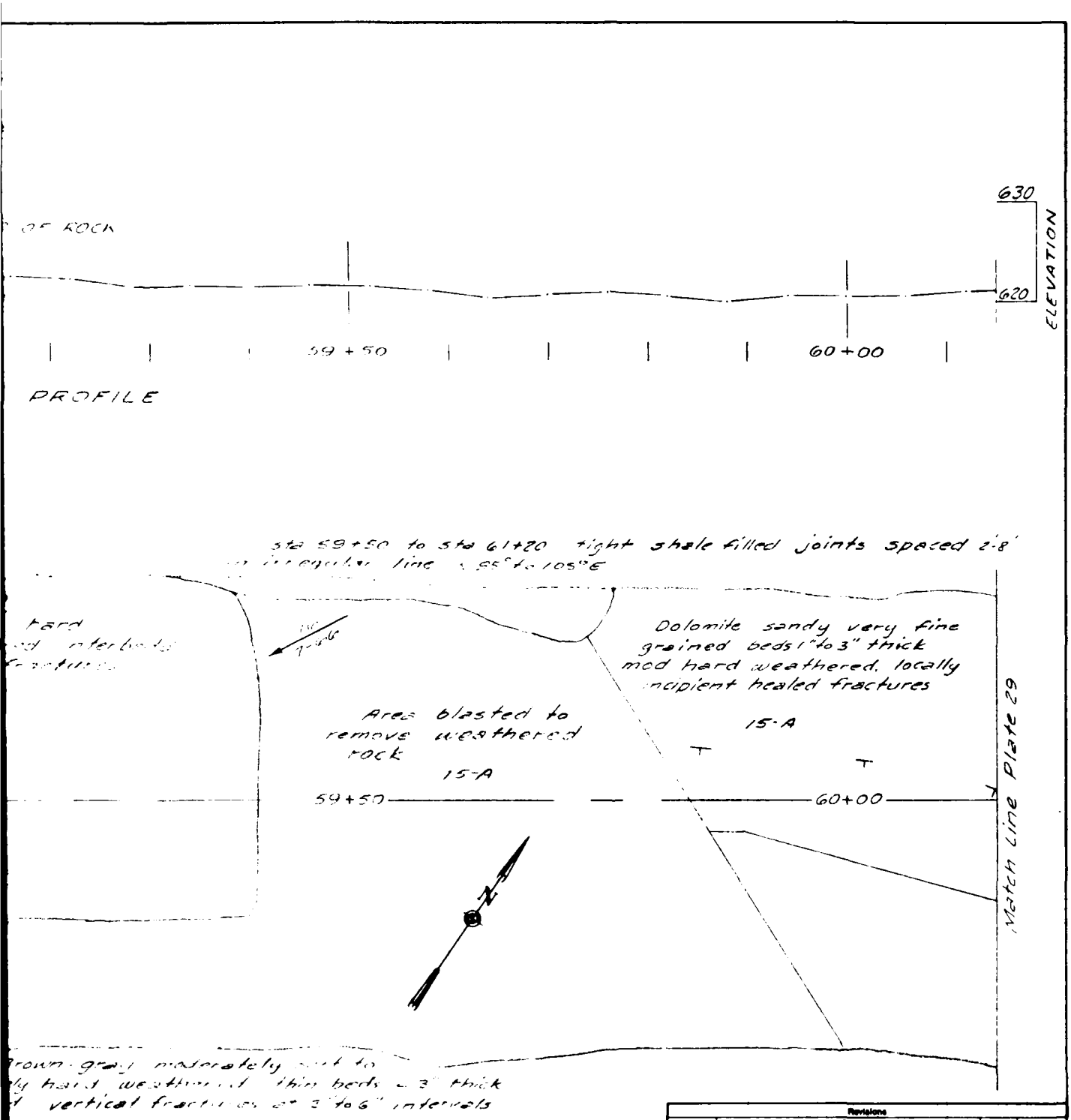


STAGE I MAP CUTOFF TRENCH STA 58+35 T

15
7-66 Direction Number & Date of Photo

For Legend See Plates 59, 60 & 61

SCALE IN



CH STA 58+35 TO STA 60+15

0 10
SCALE IN FEET

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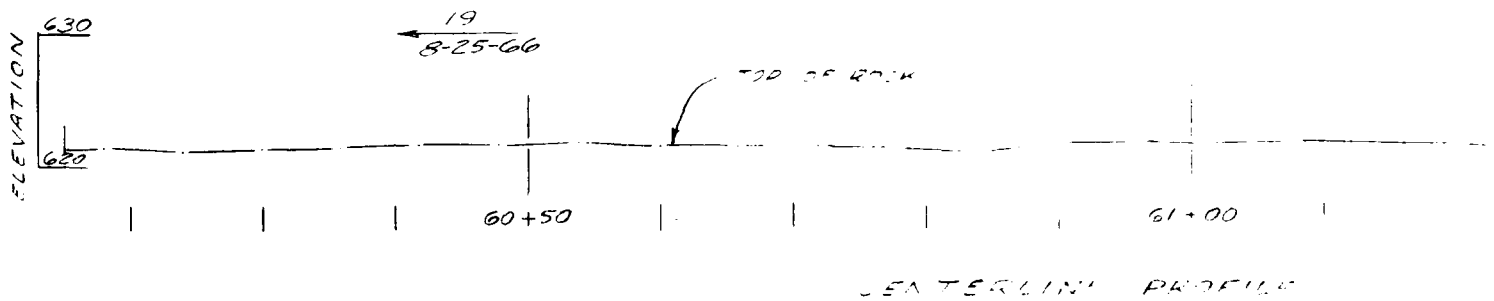
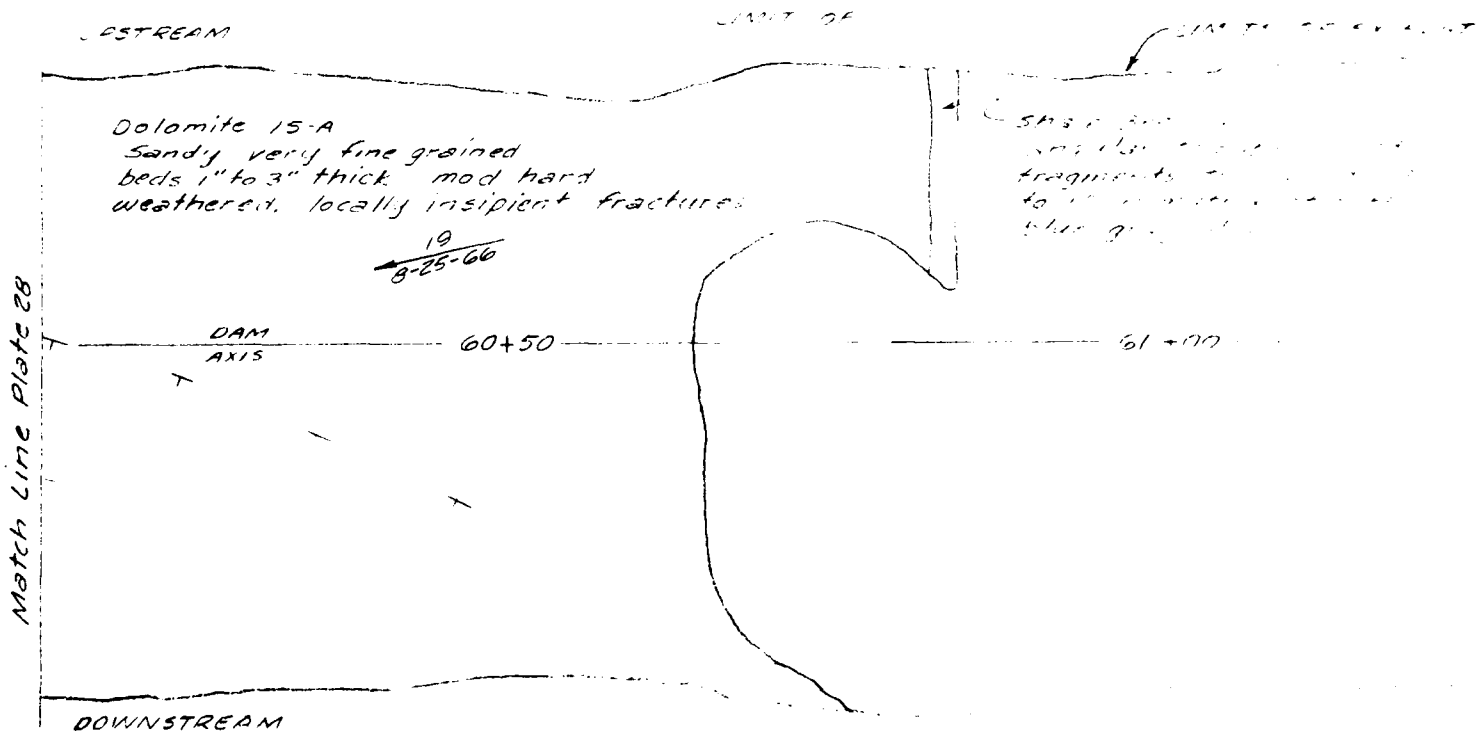
MAP CUTOFF TRENCH
STA. 58+35 TO STA. 60+15

Scale
Sheet number
Date MARCH 1968
File No. 0-12-9158

PLATE NO. 28



CENTERLINE PROFILE

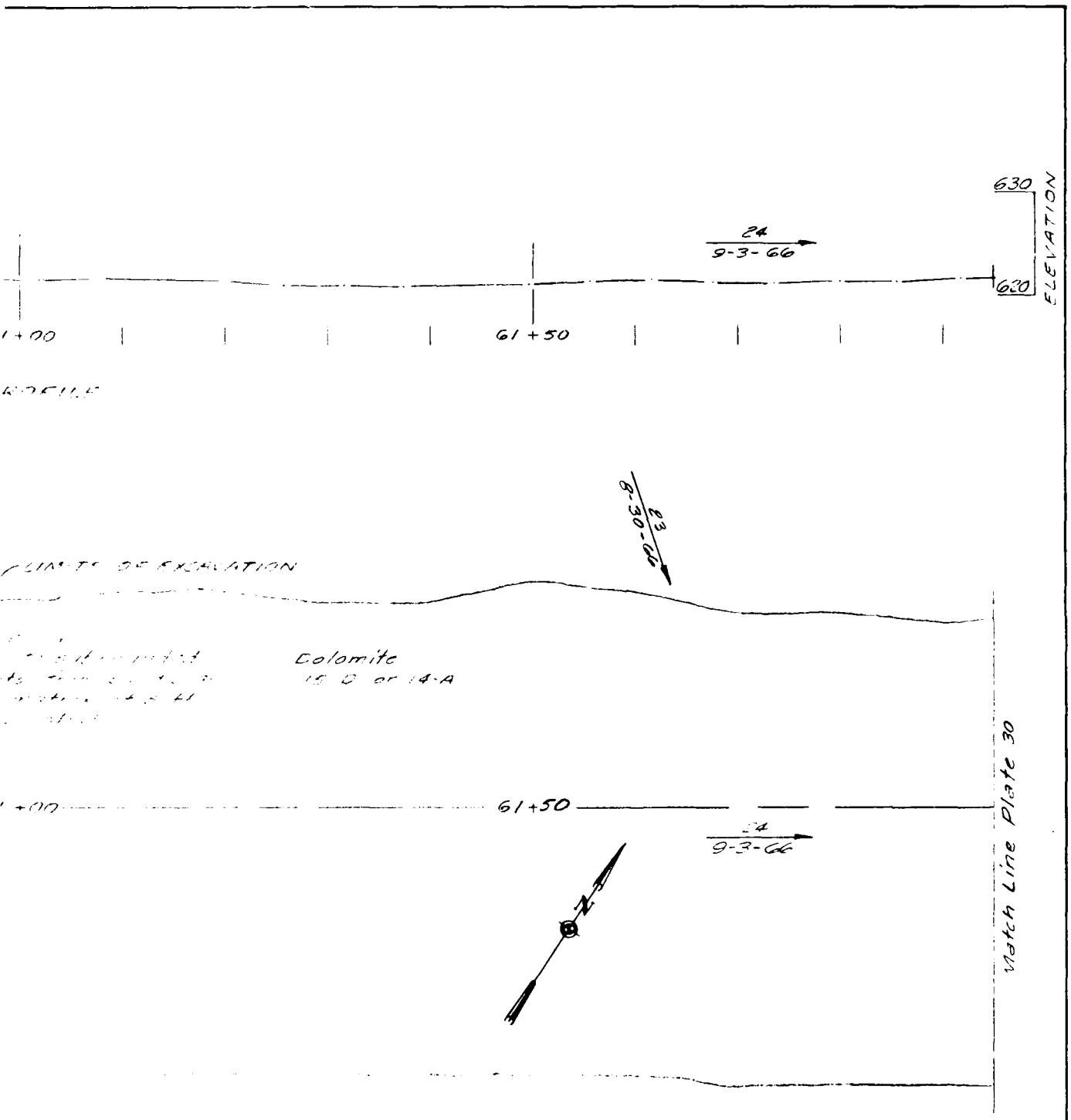


STAGE I MAP CUTOFF TRENCH

19 / 8-25-66 Direction Number & Date of Photo

For Legend See Plates 59, 60 & 61

FEET



STA 60+15 TO STA 61+95

SCALE IN FEET

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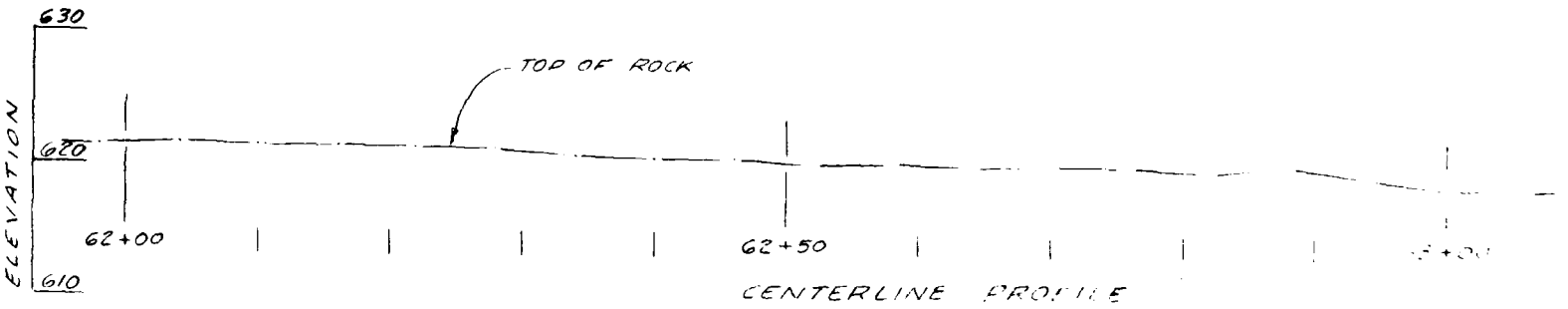
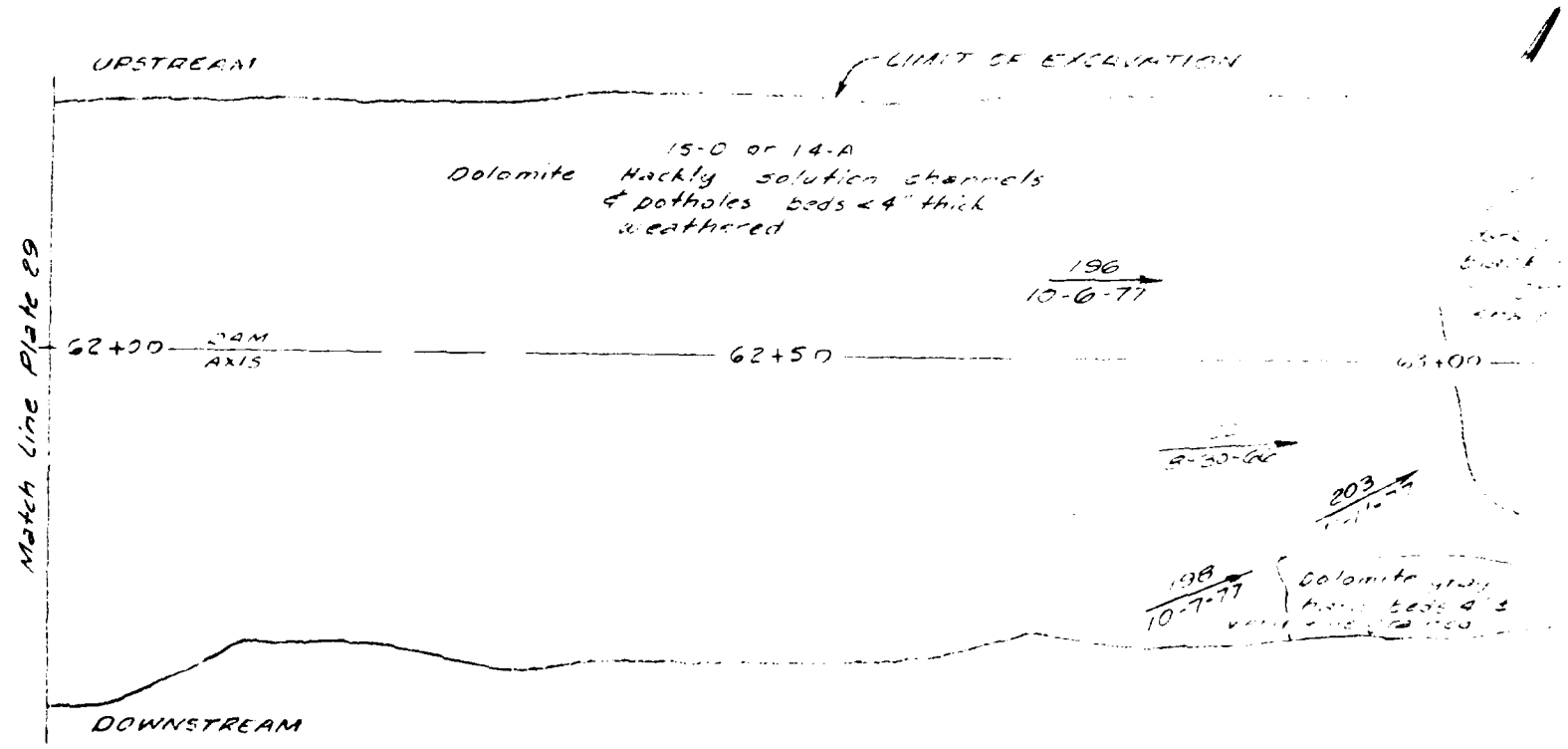
MAP CUTOFF TRENCH
STA.60+15 TO STA.61+95

Scale
Sheet number
Date MARCH 1966
Dwg No
File No. 0-12-9159

PLATE NO. 29



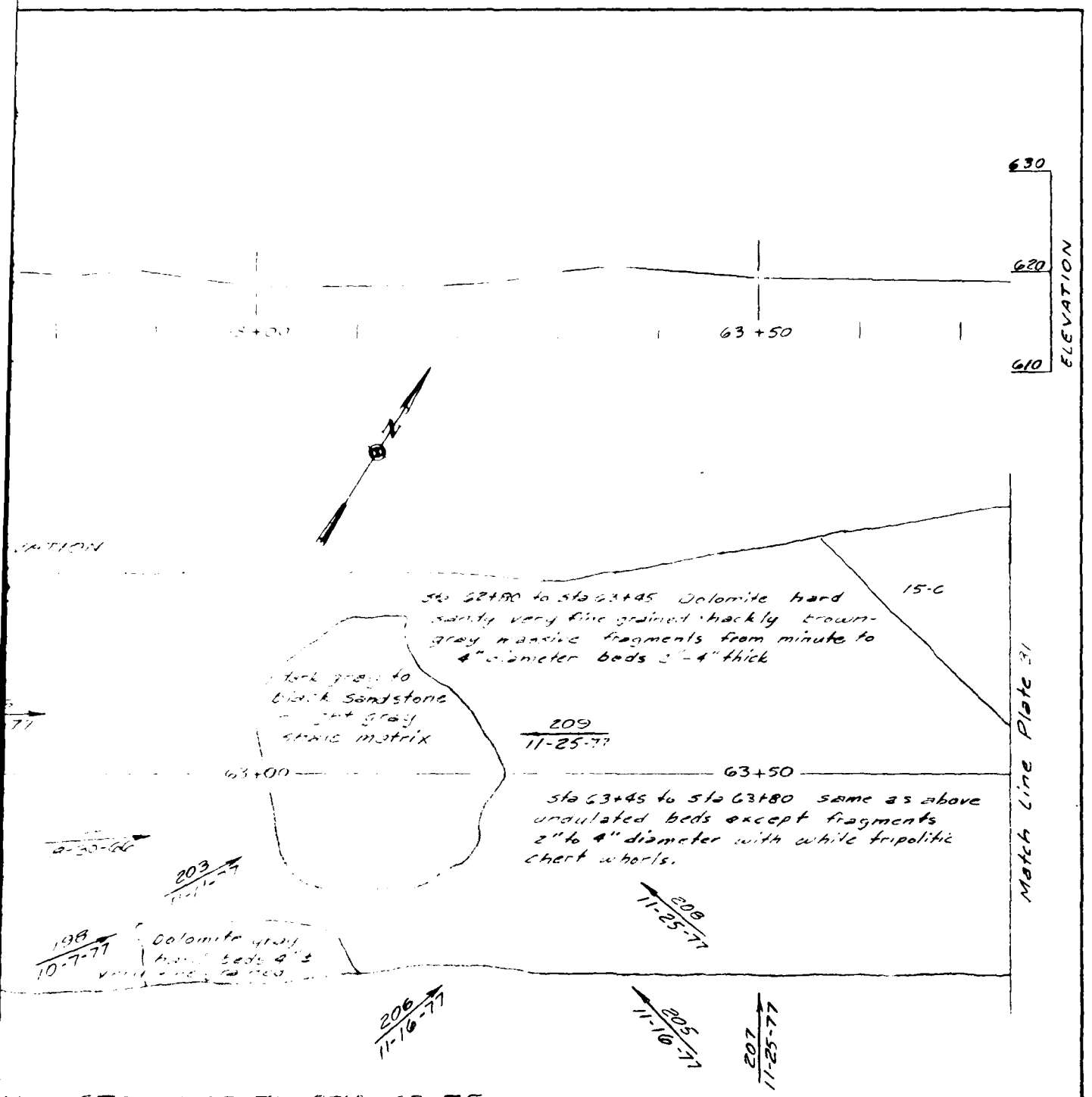


STAGE I MAP CUTOFF TRENCH STA 61+95 TO 67

22
8-30-66 Direction Number & Date of Photo

For Legend See Plates 59, 60 & 61

0 10
SCALE IN FEET



CH STA 61+95 TO STA 63+75

0 10

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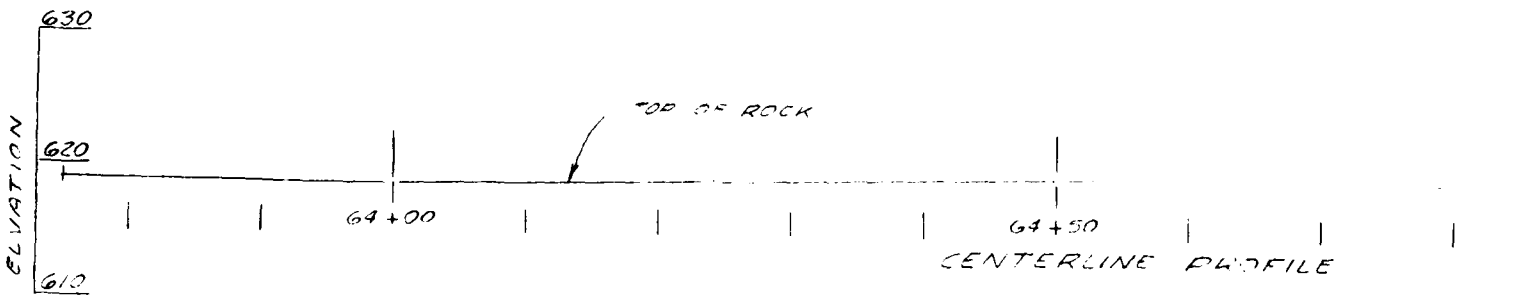
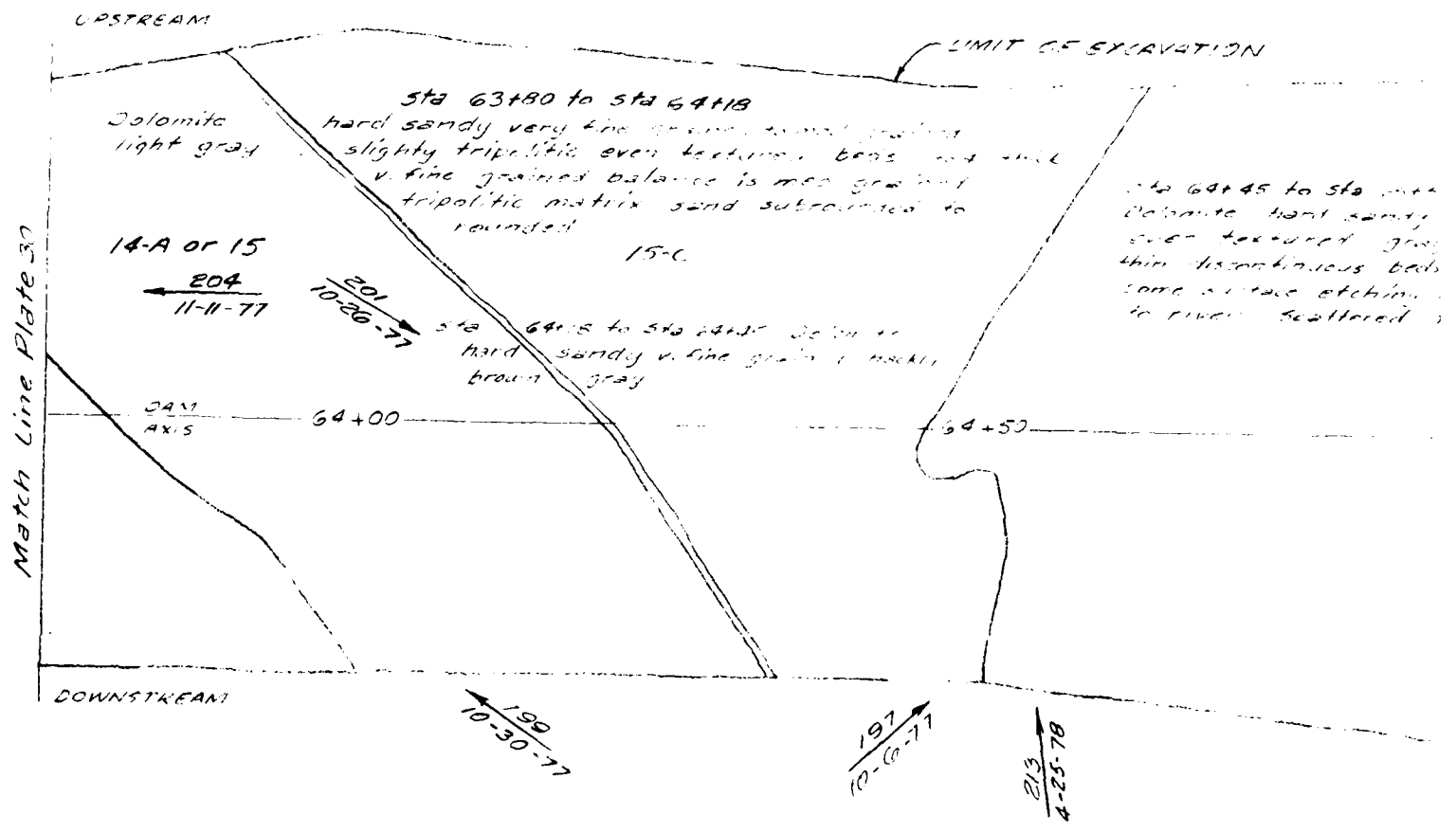
MAP CUTOFF TRENCH
STA.61+95 TO STA.63+75

Scale
Date: MARCH 1985
Dwg No
Sheet number
File No. 0-12-9160

PLATE NO.30



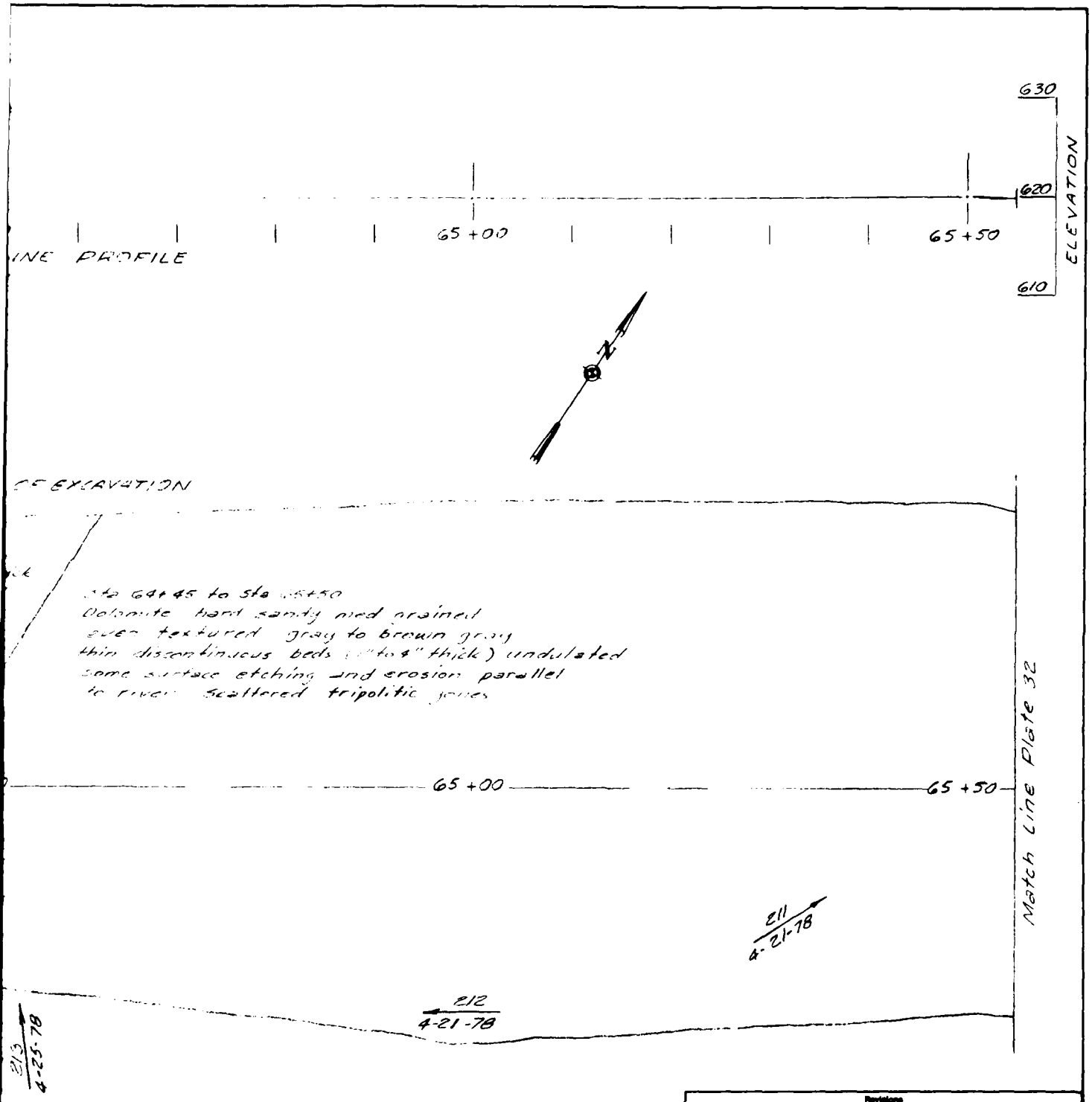


STAGE I MAP CUTOFF

Direction, Date & Number of Photo

For Legend See Plates 59, 60 & 61

SCALE IN FEET



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MAP CUTOFF TRENCH
STA. 63+75 TO STA. 65+55

Scale
Sheet number
Date: MARCH 1985
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File No. 0-12-9161

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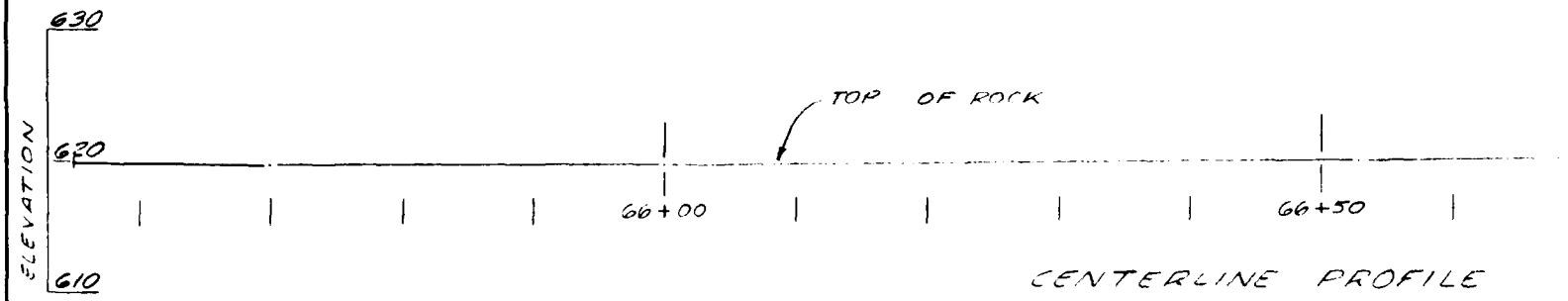
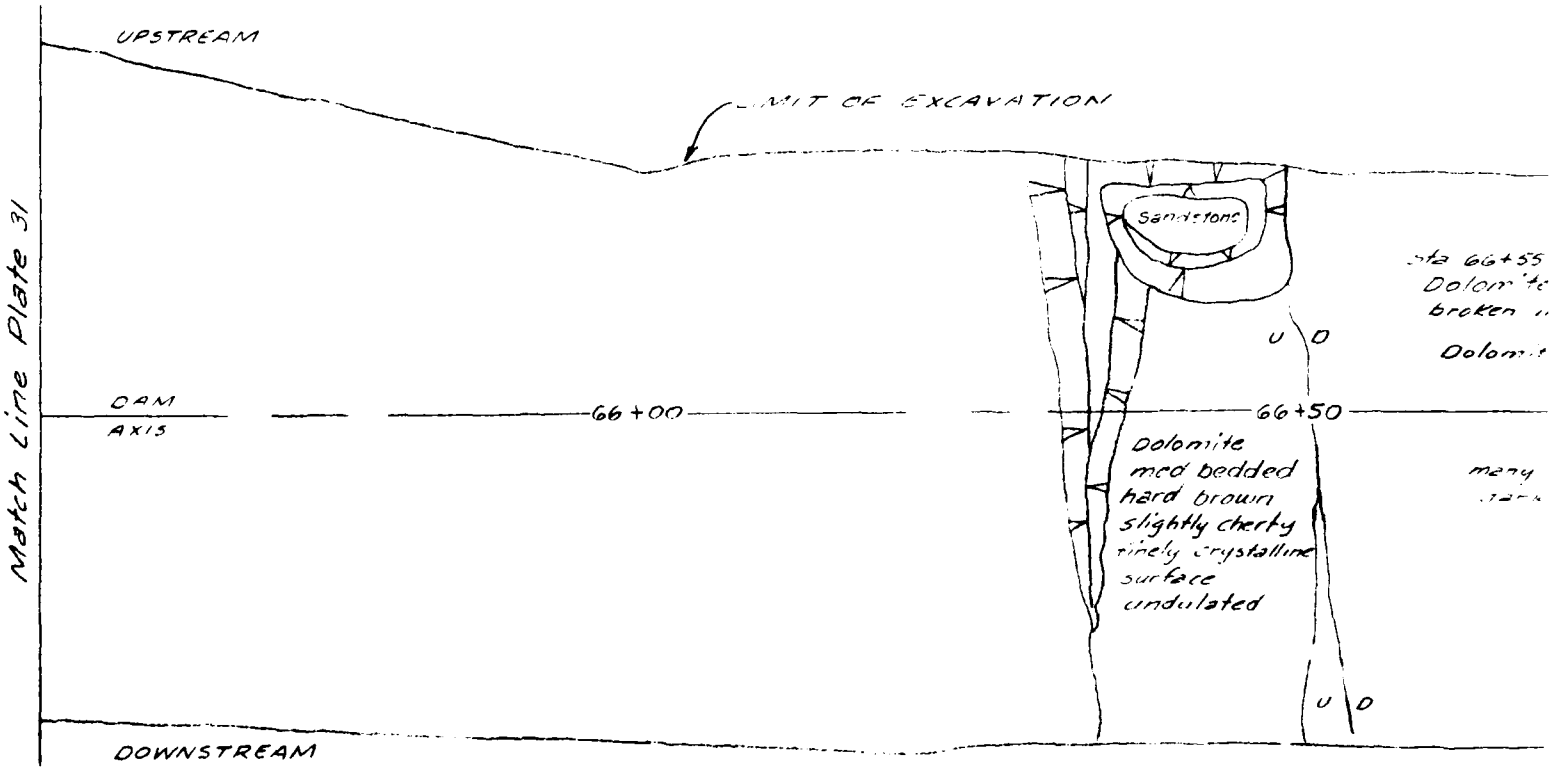
PLATE NO. 31



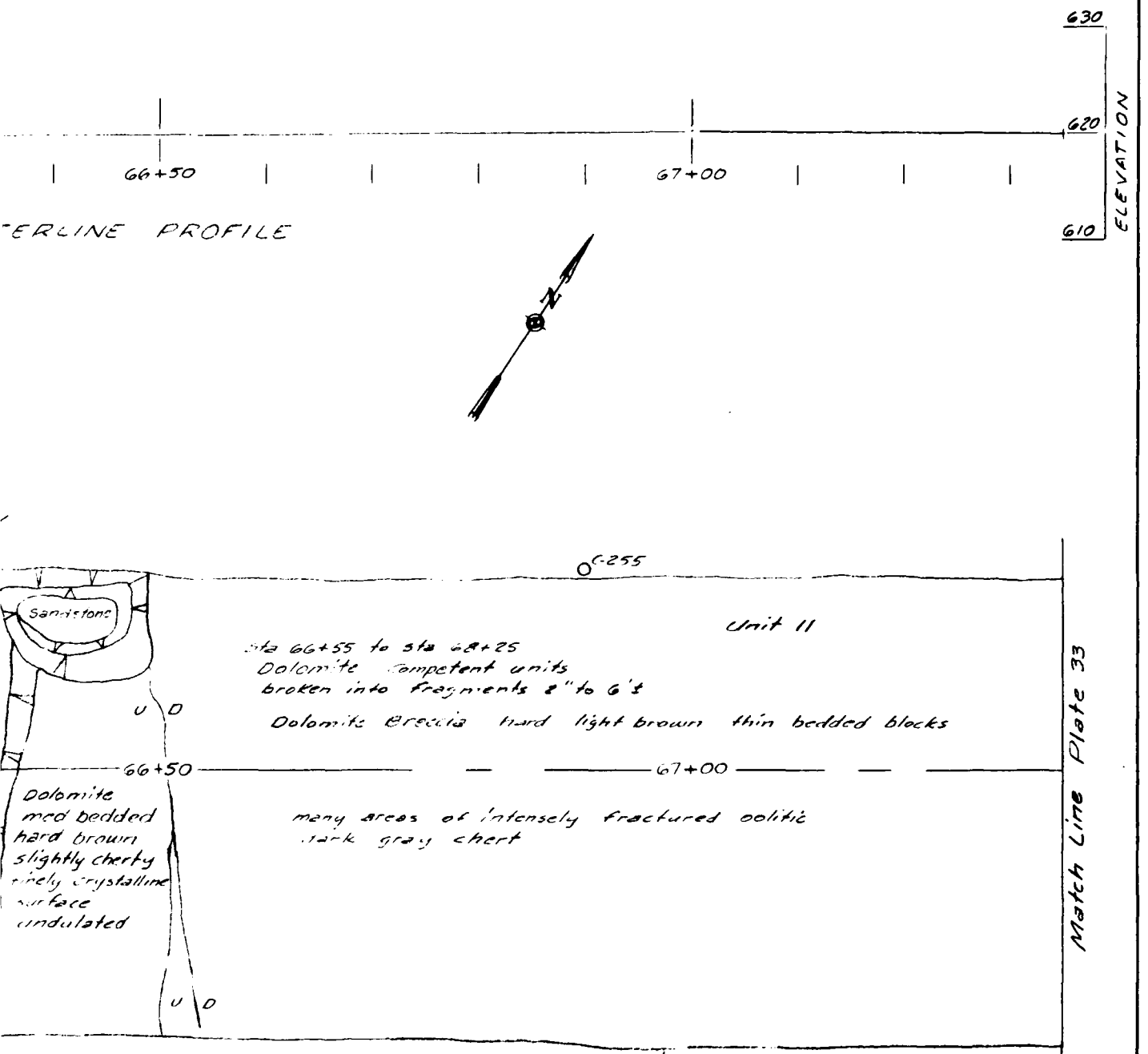


STAGE I MAP CUTOFF TRENCH STA 65+55 TO STA

Direction, Date & Number of Photo

For Legend See Plates 59, 60 & 61

SCALE IN FE



STA 65+55 TO STA 67+35

0 10
SCALE IN FEET

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STA.65+55 TO STA.67+35

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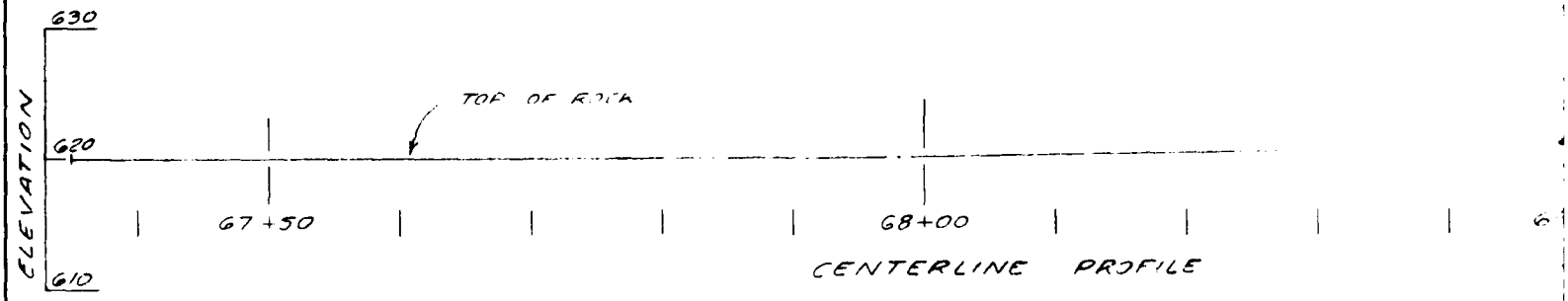
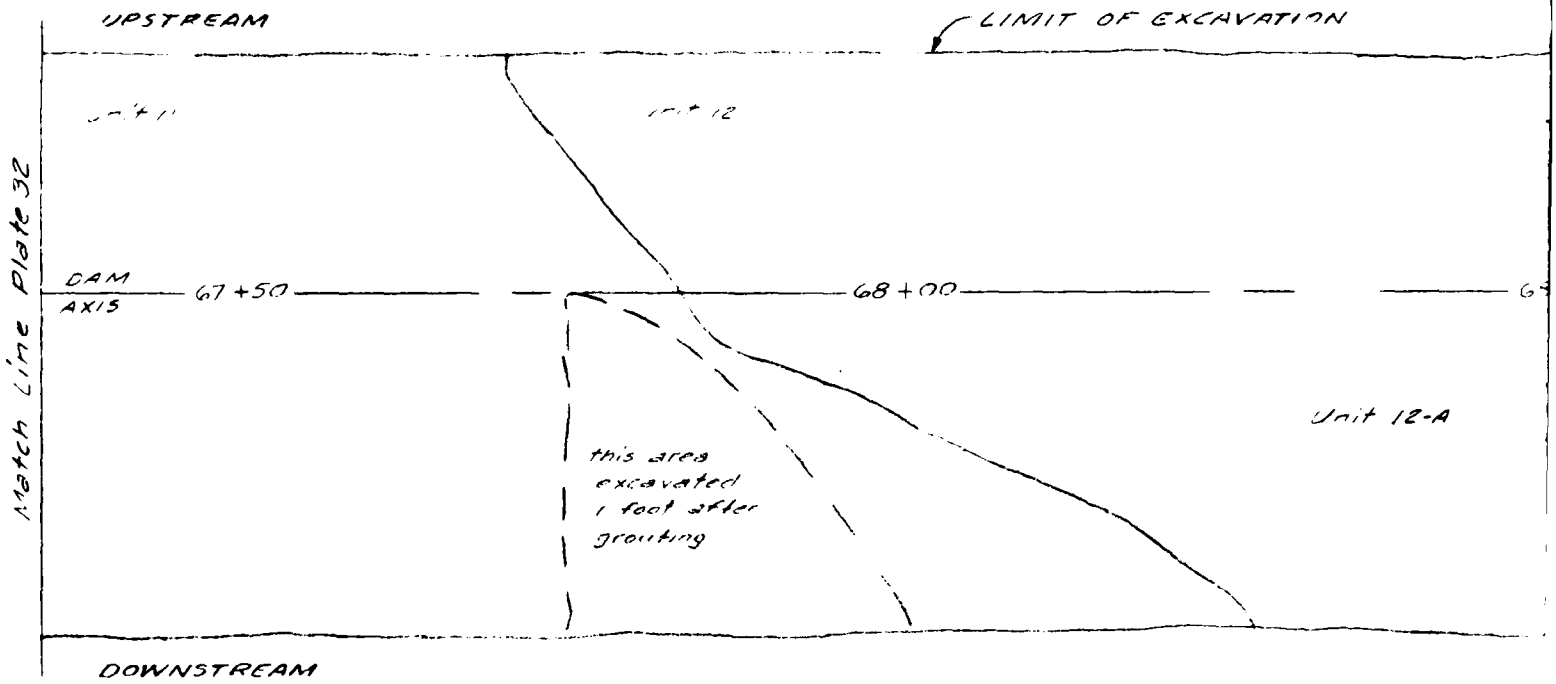
PLATE NO.32



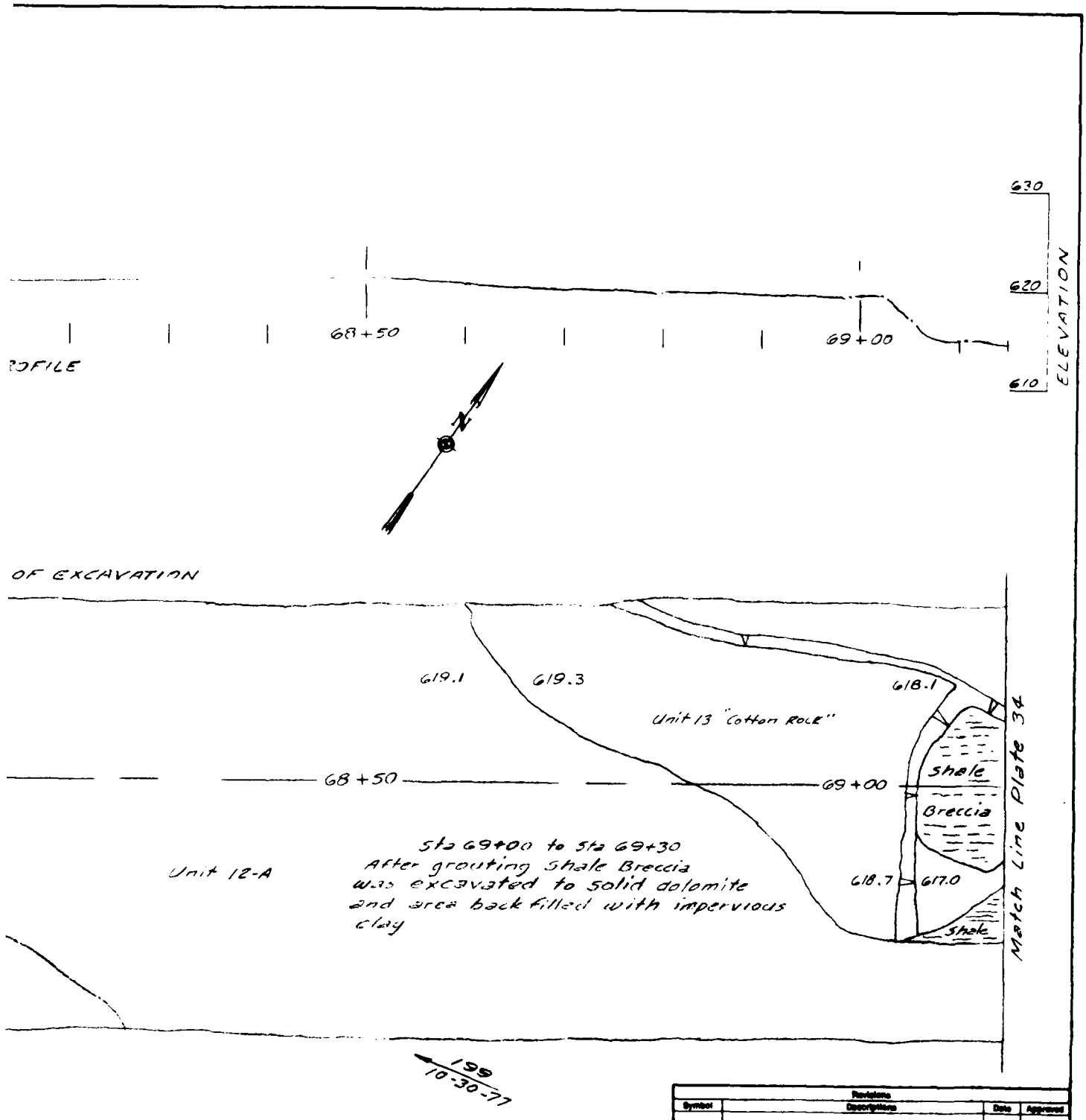


STAGE I MAP CUTOFF TRENCH STA 67+35 TO STA

10-30-77 199 Direction, Date & Number of Photo

For Legend See Plates 59, 60 & 61

0 10
SCALE IN FEET



STA 67+35 TO STA 69+15

0 10
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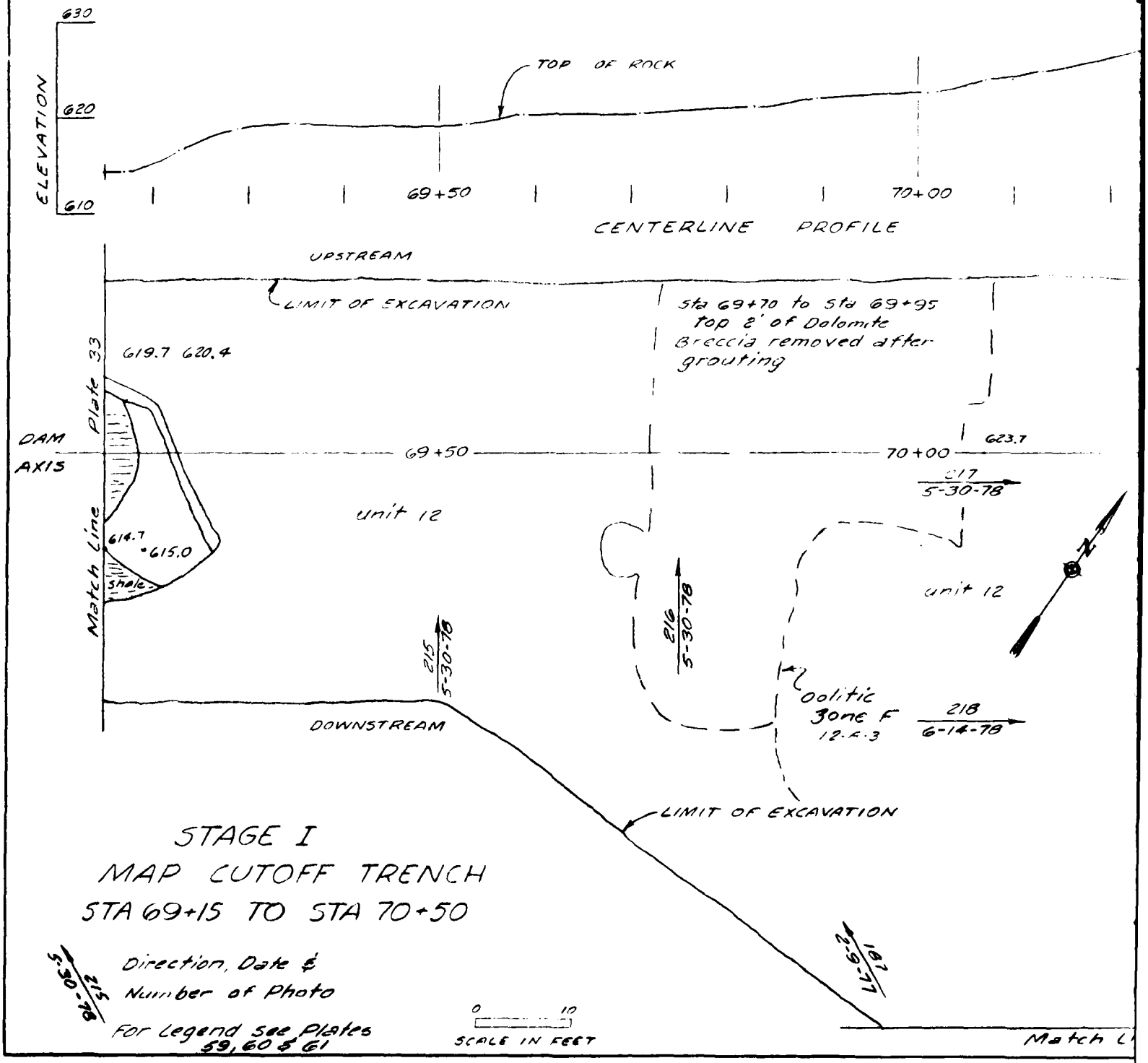
MAP CUTOFF TRENCH
STA.67+35 TO STA.69+15

Scale
Date: MARCH 1986
Sheet number
Dwg. No.
File No. 0-12-9163

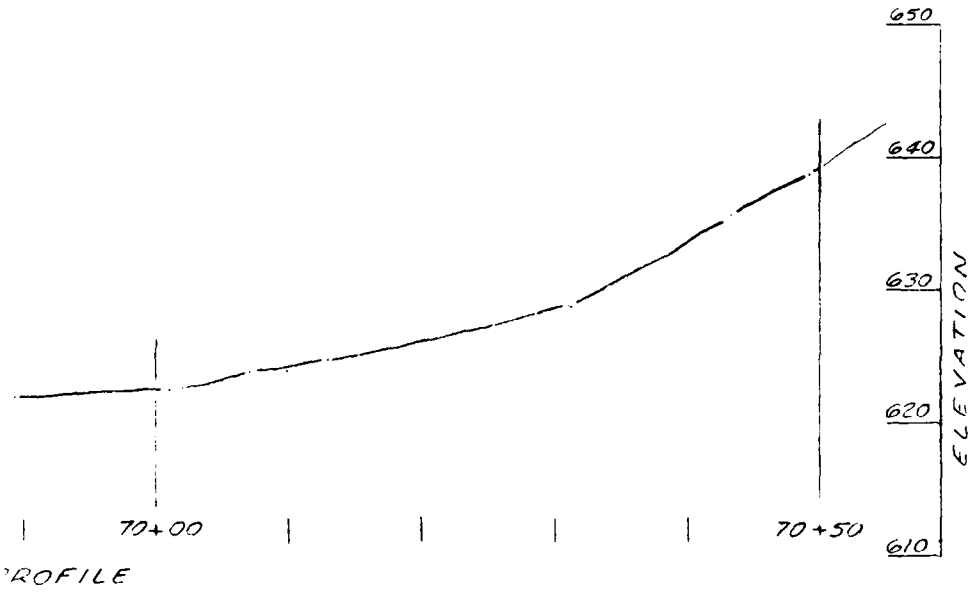
PLATE NO. 33

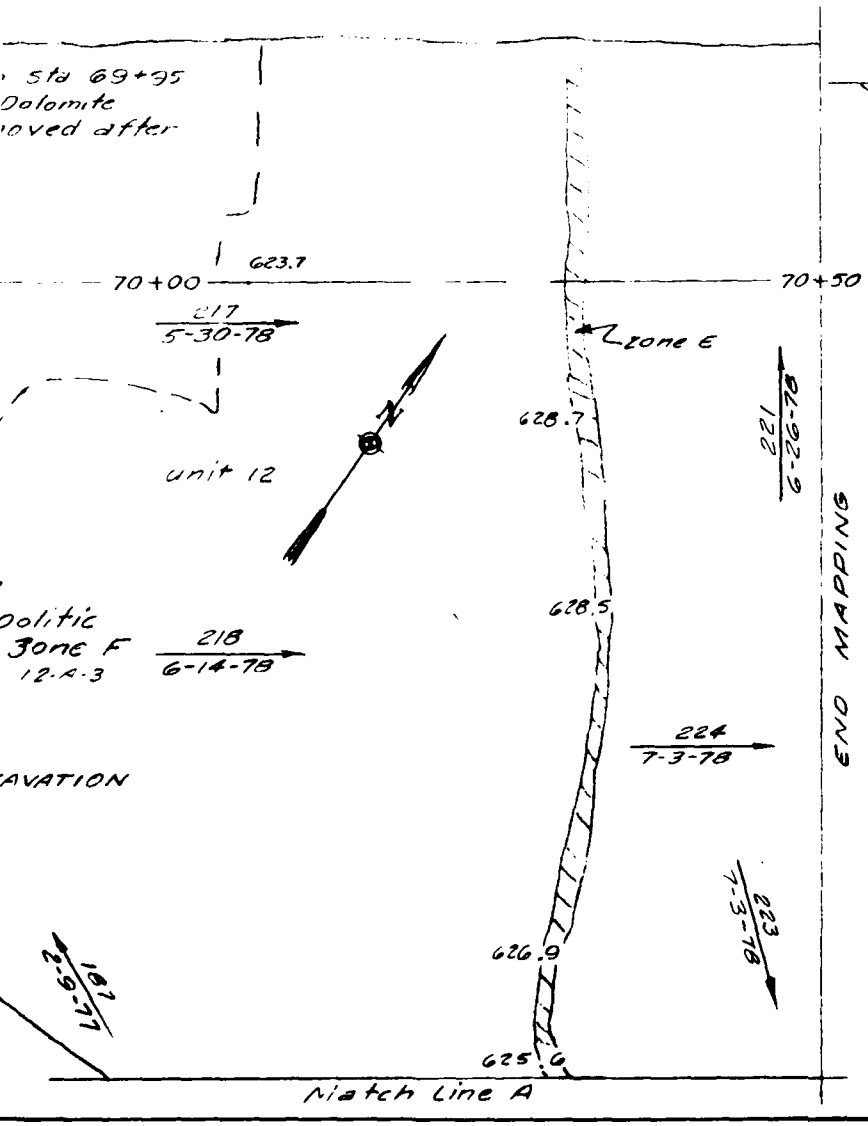


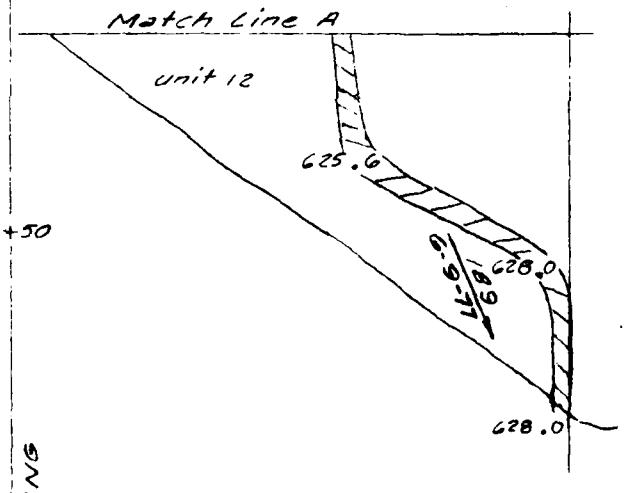
STAGE I
MAP CUTOFF TRENCH
STA 69+15 TO STA 70+50

215 / 5-30-78 Direction, Date & Number of Photo

For Legend see Plates 59, 60 & 61







Revisions			
Symbol	Descriptions	Date	Approved

U. S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

Designed by:
Drawn by:
Checked by:
Submitted by:

OSAGE RIVER, MISSOURI
HARRY S. TRUMAN DAM & RESERVOIR
CONSTRUCTION FOUNDATION REPORT

MAP CUTOFF TRENCH
STA.69+15 TO STA.70+50

Scale:
Date: MARCH 1985
Sheet number:
Dwg. No.
File No. 0-12-9164

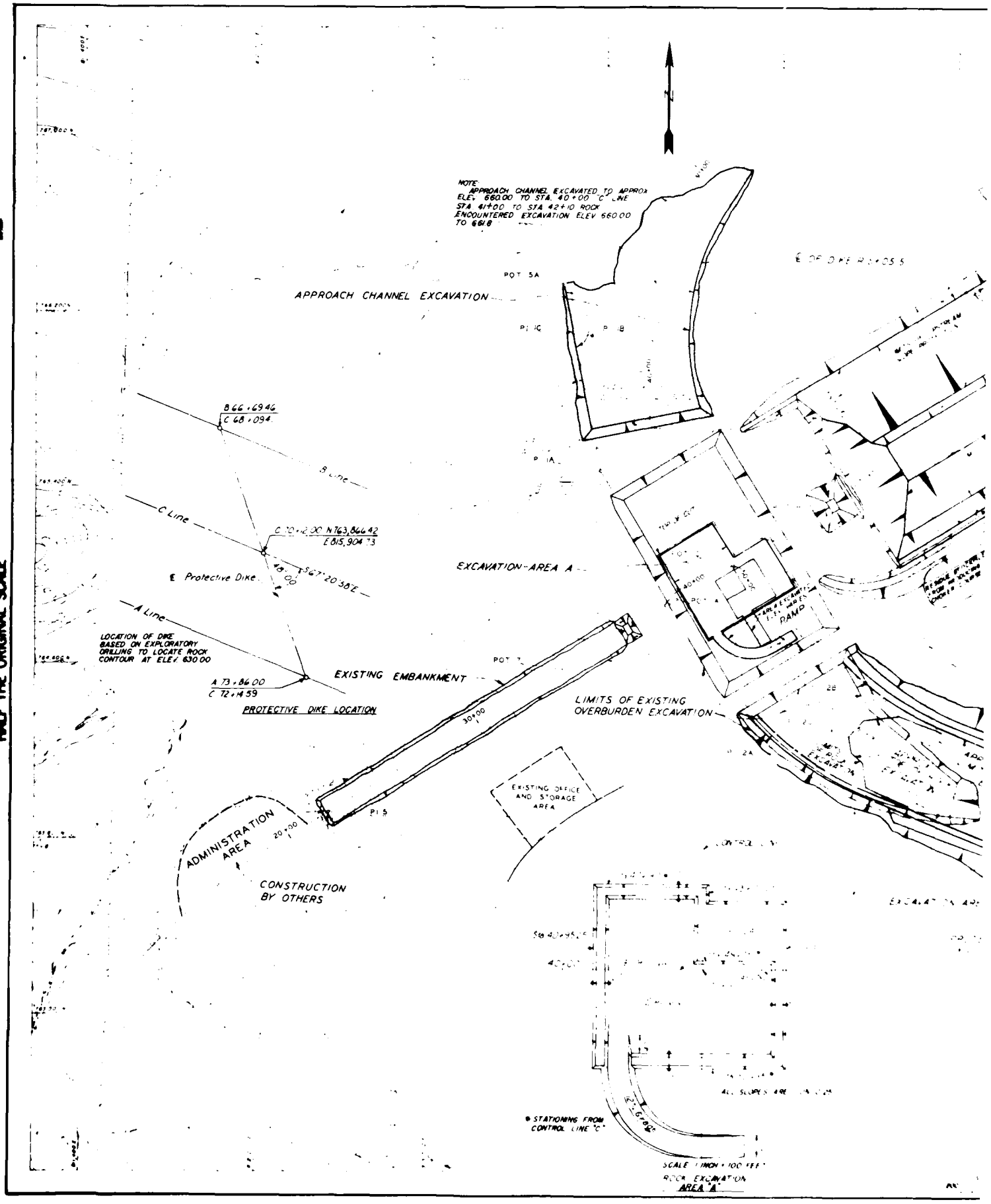
PLATE NO.34

STAGE II CONSTRUCTION

UCTION

STAGE II CONSTRUCTION

HAVE BEEN REDUCED TO ONE HALF THE ORIGINAL SCALE



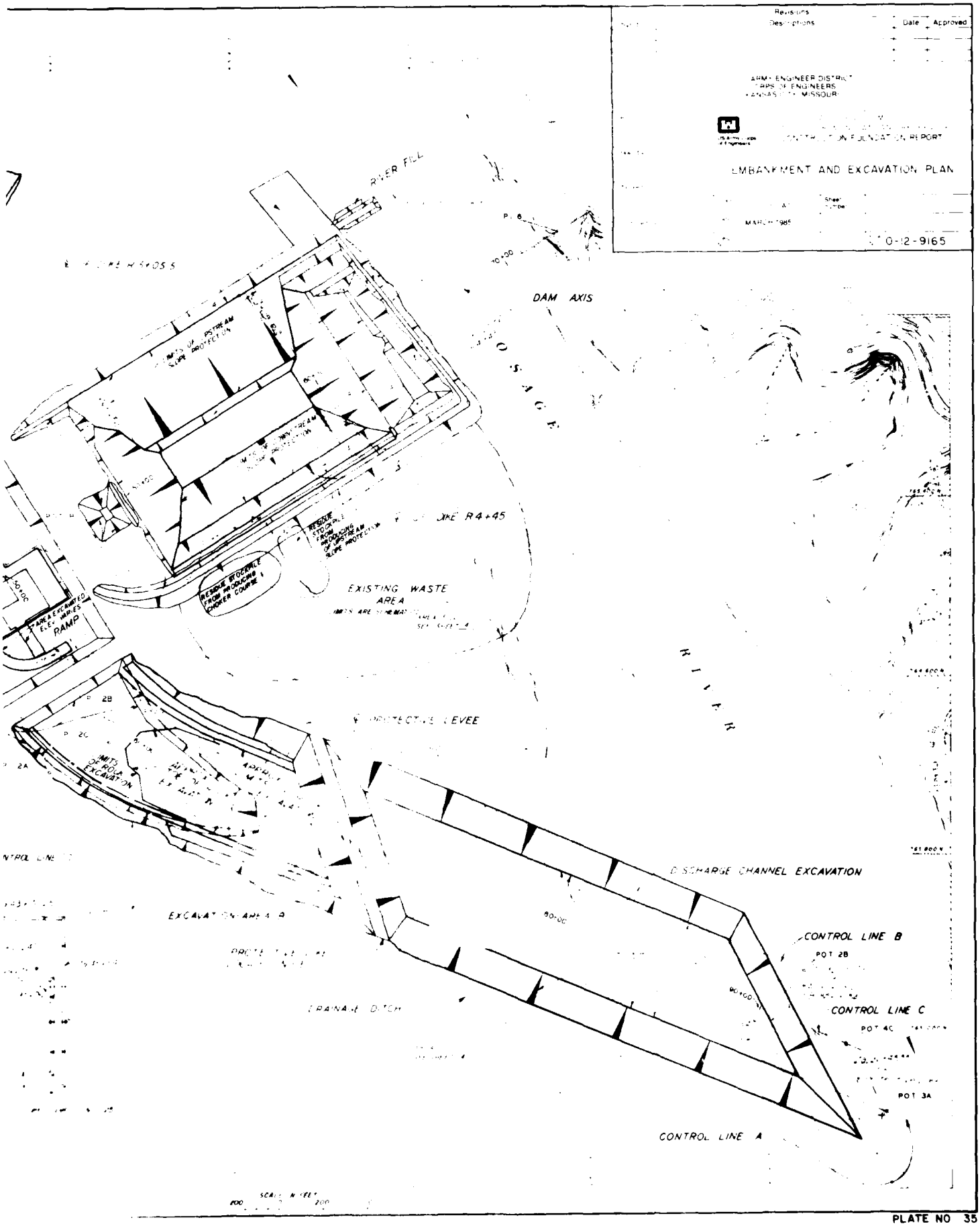
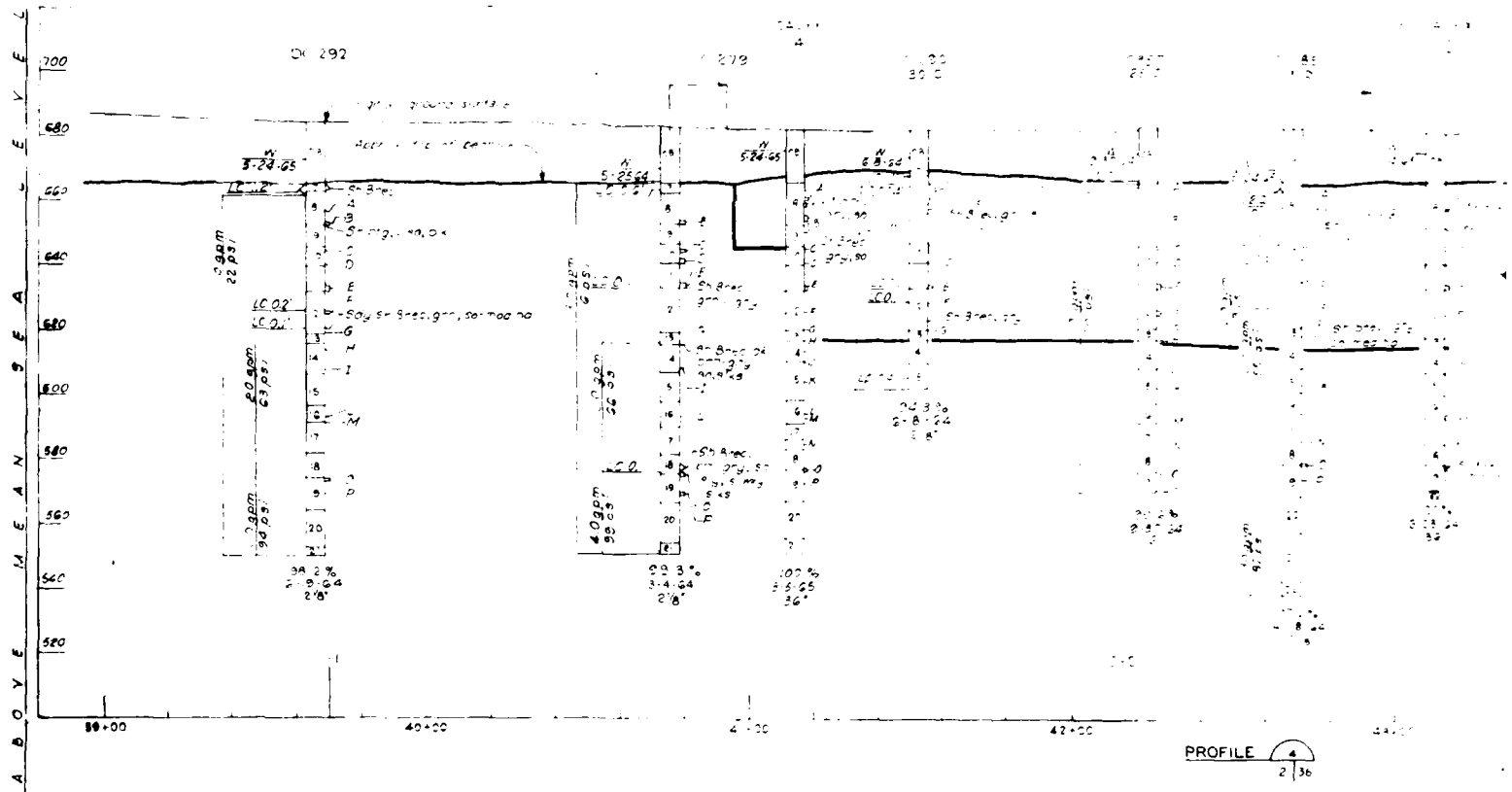
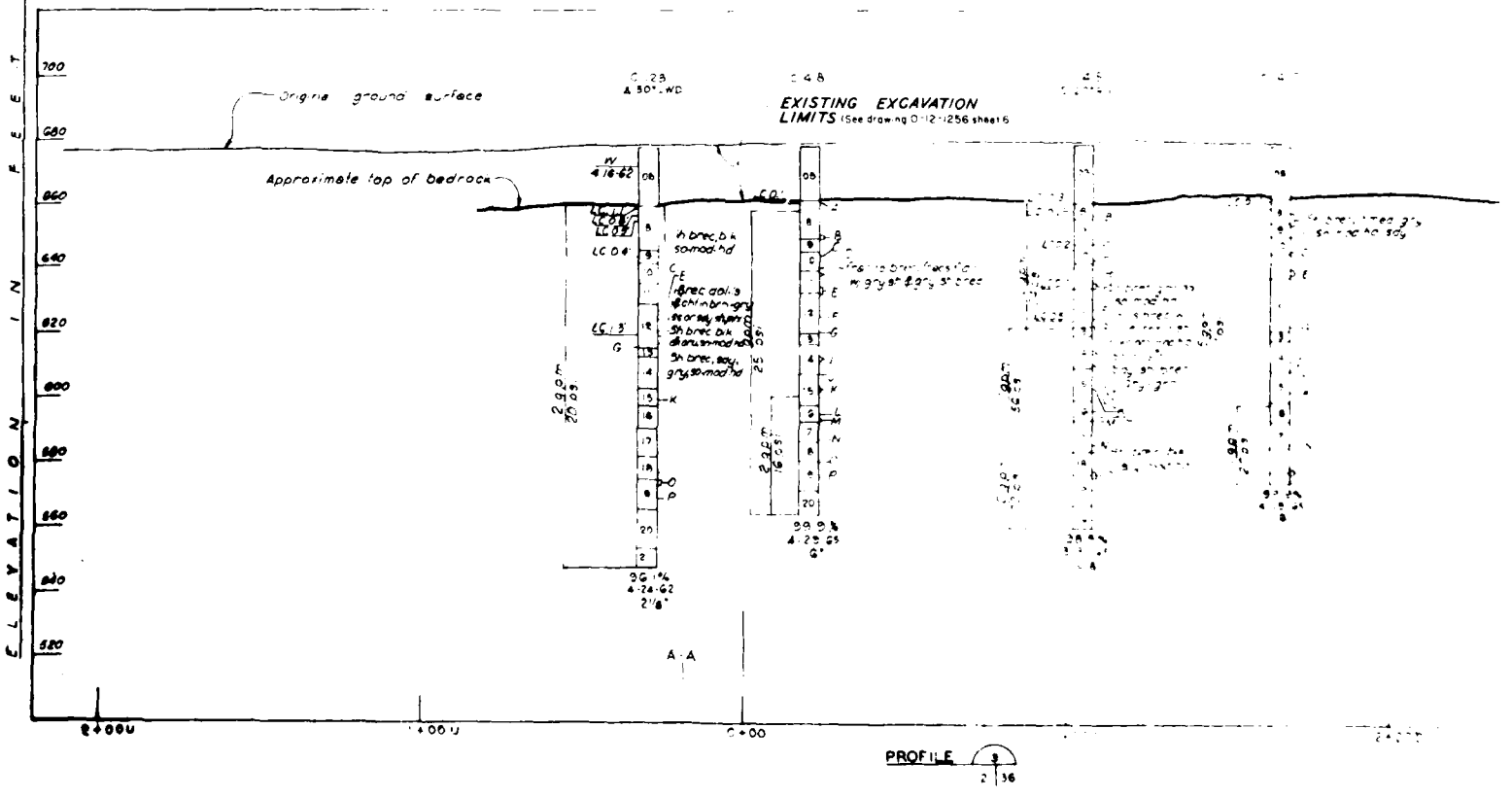
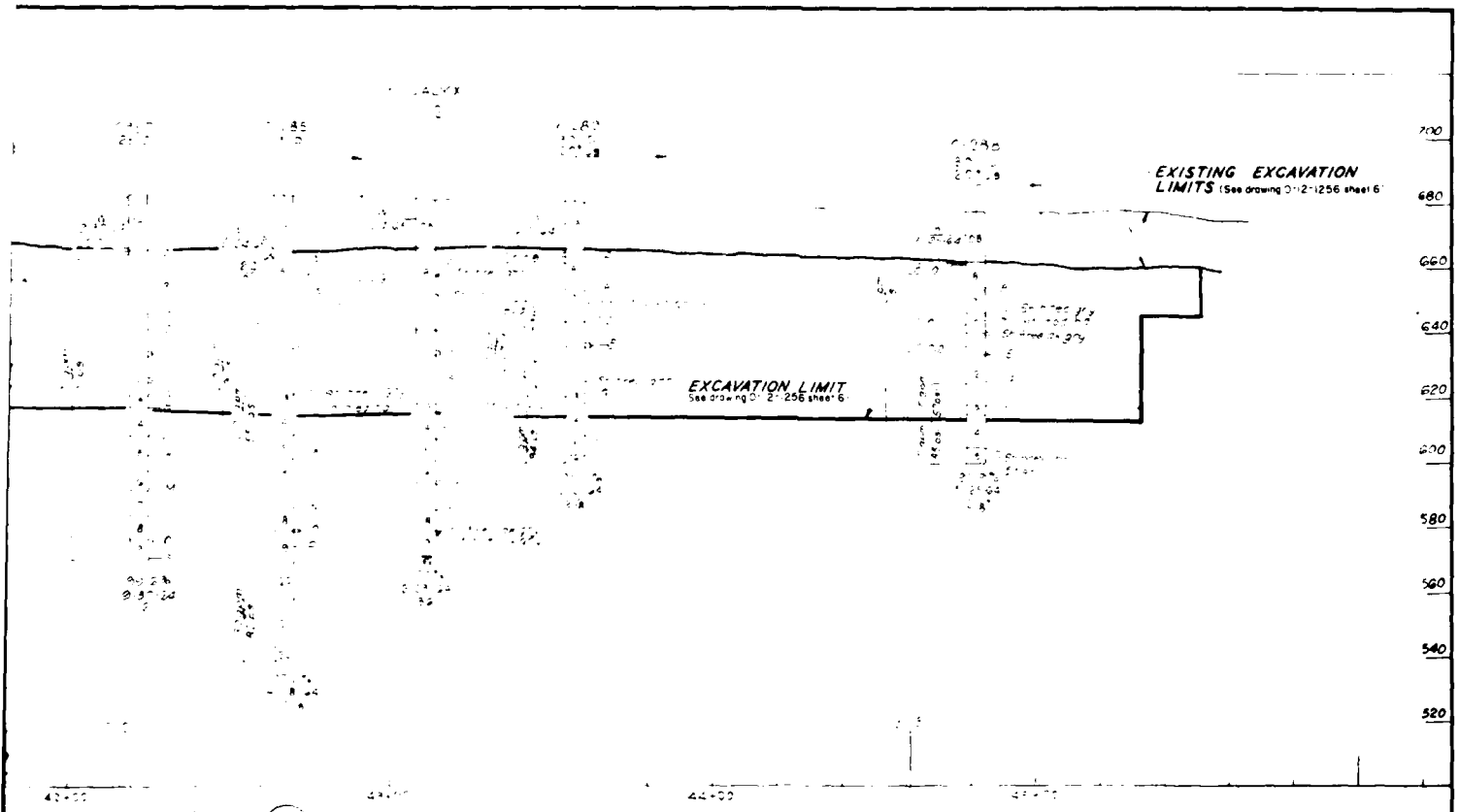

Revisions
Descriptions
Date
Approved
ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI
EMBANKMENT AND EXCAVATION PLAN
MARCH 1985
0-12-9165
RIVER FILL
DAM AXIS
O S A G E
R I V E R
DIKE R4+45
EXISTING WASTE AREA
RESIDUE STOCKPILE FROM PRODUCING CHOPPER COURSE
RESIDUE STOCKPILE FROM PRODUCING UPSTREAM SLOPE PROTECTION
RAMP
PROTECTIVE LEVEE
LIMITS OF ROLLA EXCAVATION
DISCHARGE CHANNEL EXCAVATION
EXCAVATION AREA B
DRAINAGE DITCH
CONTROL LINE B
POT 2B
CONTROL LINE C
POT 4C
POT 3A
CONTROL LINE A
SCALE IN FEET
100
200

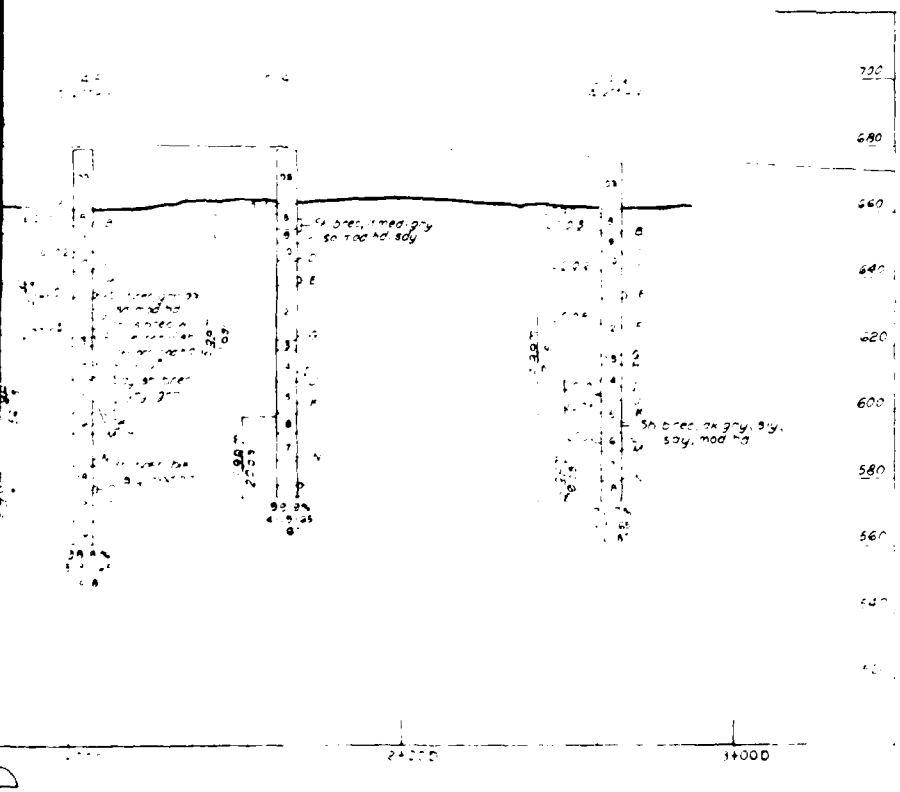
PLATE NO 35


ELEVATION IN FEET ABOVE MEAN SEA LEVEL
700
680
660
640
620
600
580
560
540
520
40+00
42+00
PROFILE


ELEVATION IN FEET ABOVE MEAN SEA LEVEL
700
680
660
640
620
600
580
560
540
520
Original ground surface
Approximate top of bedrock
EXISTING EXCAVATION LIMITS (See drawing 0-12-1256 sheet 6
A-A
0+00
PROFILE



PROFILE 4
2 36



NOTES

[illegible] HOLE NOS AND PROFILES SEE PLATE 2

[illegible] GEOLOGIC COLUMN AND LEGEND. [illegible] DATA LEGEND SEE PLATE 4.

WATER [illegible] READINGS WERE TAKEN IMMEDIATELY [illegible] BACKFILLING HOLE OR WHEN HOLE WAS [illegible] OPEN, READINGS ARE THE LAST RECORDED

WHERE [illegible] INDICATED BY LETTERS (A-P), ARE NOT [illegible] WERE GENERALLY MASKED OR [illegible] ABLE.

[illegible] ARE INDICATED BY A LINE, THE [illegible] LESS THAN 0.5 FOOT

DRAWINGS IN THIS FOLIO HAVE BEEN REDUCED TO ONE HALF THE ORIGINAL SCALE

Symbol	Revisions Descriptions	Date	Approved

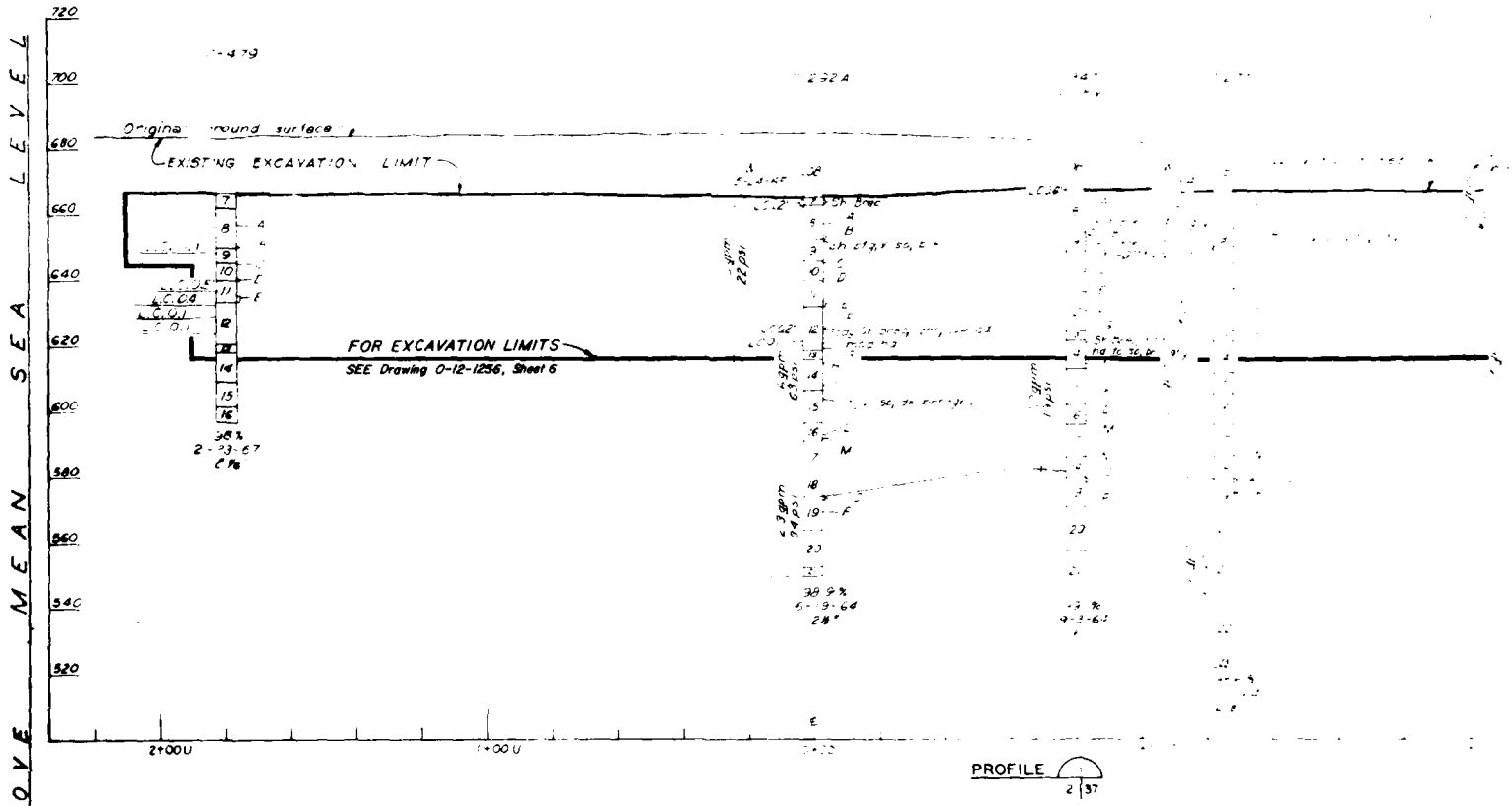
U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

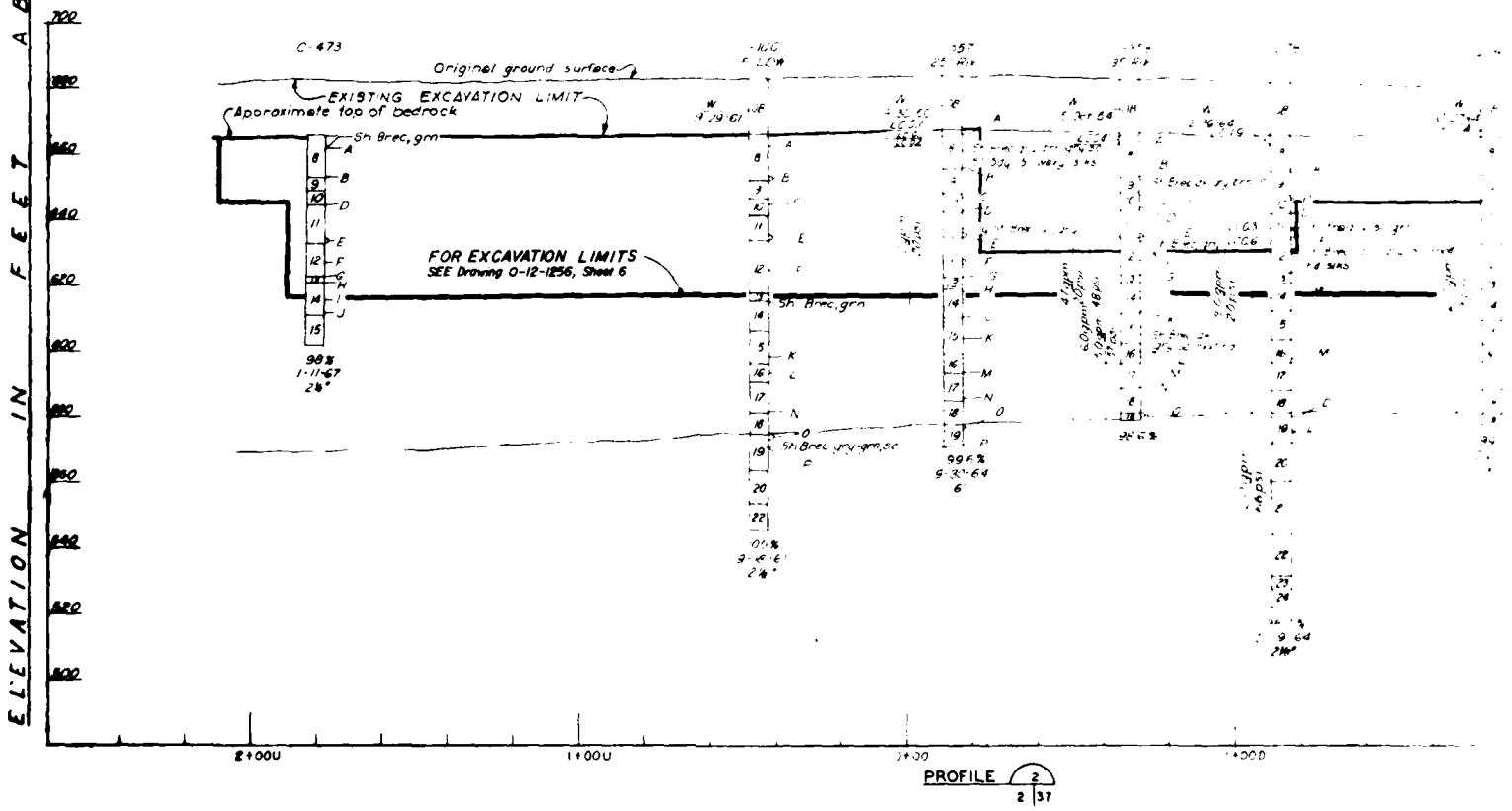
US Army Corps of Engineers

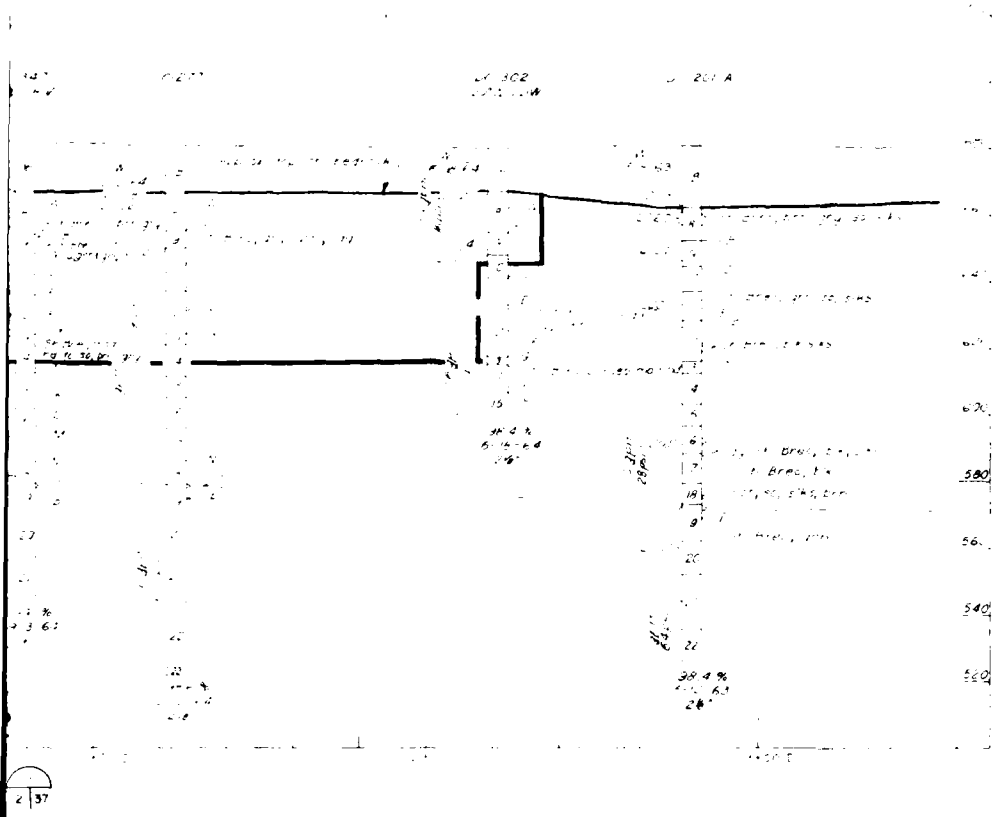
[illegible] MISSOURI RIVER
[illegible] MAINSTEM SYSTEM RESERVOIRS
CONSTRUCTION FOUNDATION REPORT

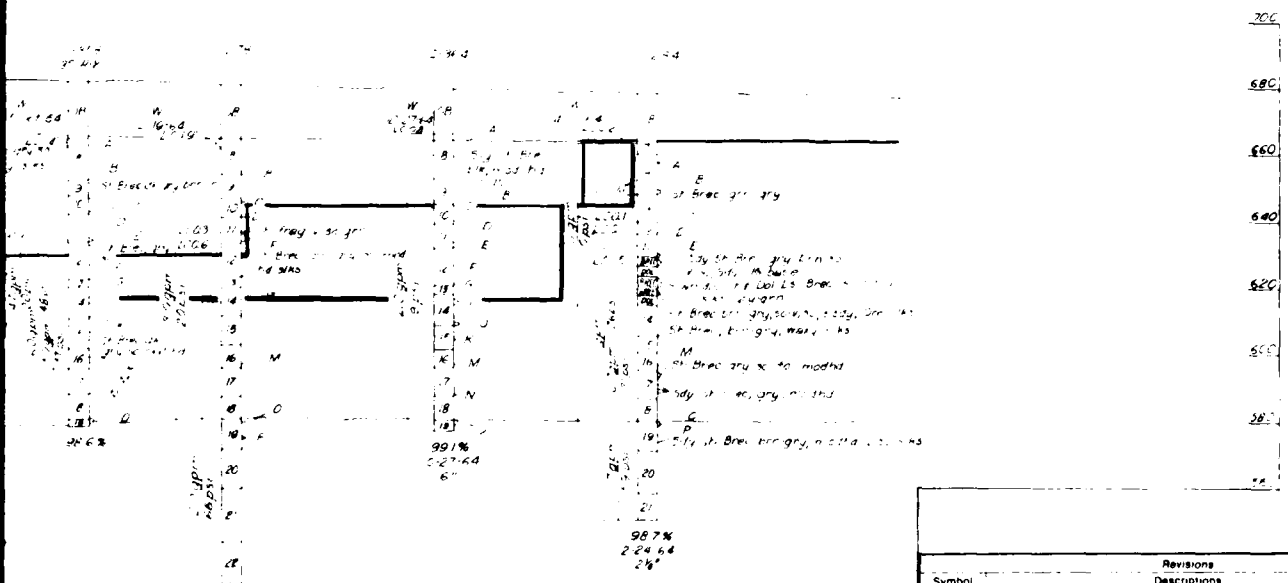
GEOLOGIC PROFILES
4-4 AND 3-3

Scale	AS SHOWN	Sheet number	
Date	MARCH 1985		
Dwg No		File No	0-12-9166


ELEVATION IN FEET ABOVE MEAN SEA LEVEL
Original ground surface
EXISTING EXCAVATION LIMIT
FOR EXCAVATION LIMITS
SEE Drawing 0-12-1256, Sheet 6
2+00U
1+00U
PROFILE
2 37


C-473
Original ground surface
EXISTING EXCAVATION LIMIT
Approximate top of bedrock
Sh Brec, grn
FOR EXCAVATION LIMITS
SEE Drawing 0-12-1256, Sheet 6
2+00U
1+00U
PROFILE 2
2 37





SEE PLATE 4

DRAWINGS IN THIS FOLIO HAVE BEEN REDUCED TO ONE HALF THE ORIGINAL SCALE

Revisions			
Symbol	Descriptions	Date	Approved

U. S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

Designed by

Drawn by

Checked by

Submitted by

US Army Corps of Engineers

CONSTRUCTION FOUNDATION REPORT

GEOLOGIC PROFILES
1-1 AND 2-2

Scale AS SHOWN

Sheet number

Date MARCH 1985

Dwg No.

File No. 0-12-9167

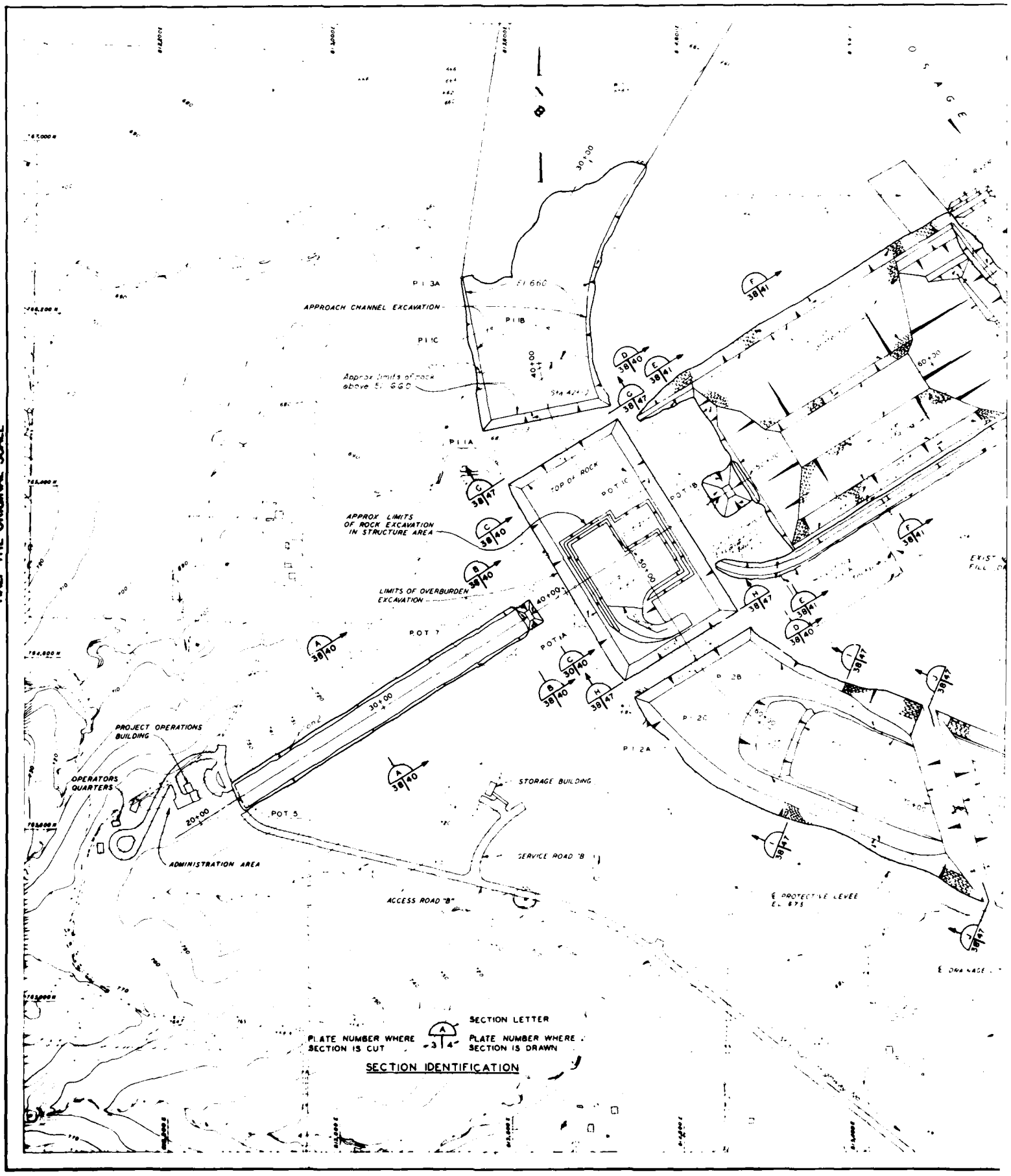
PLATE NO. 37

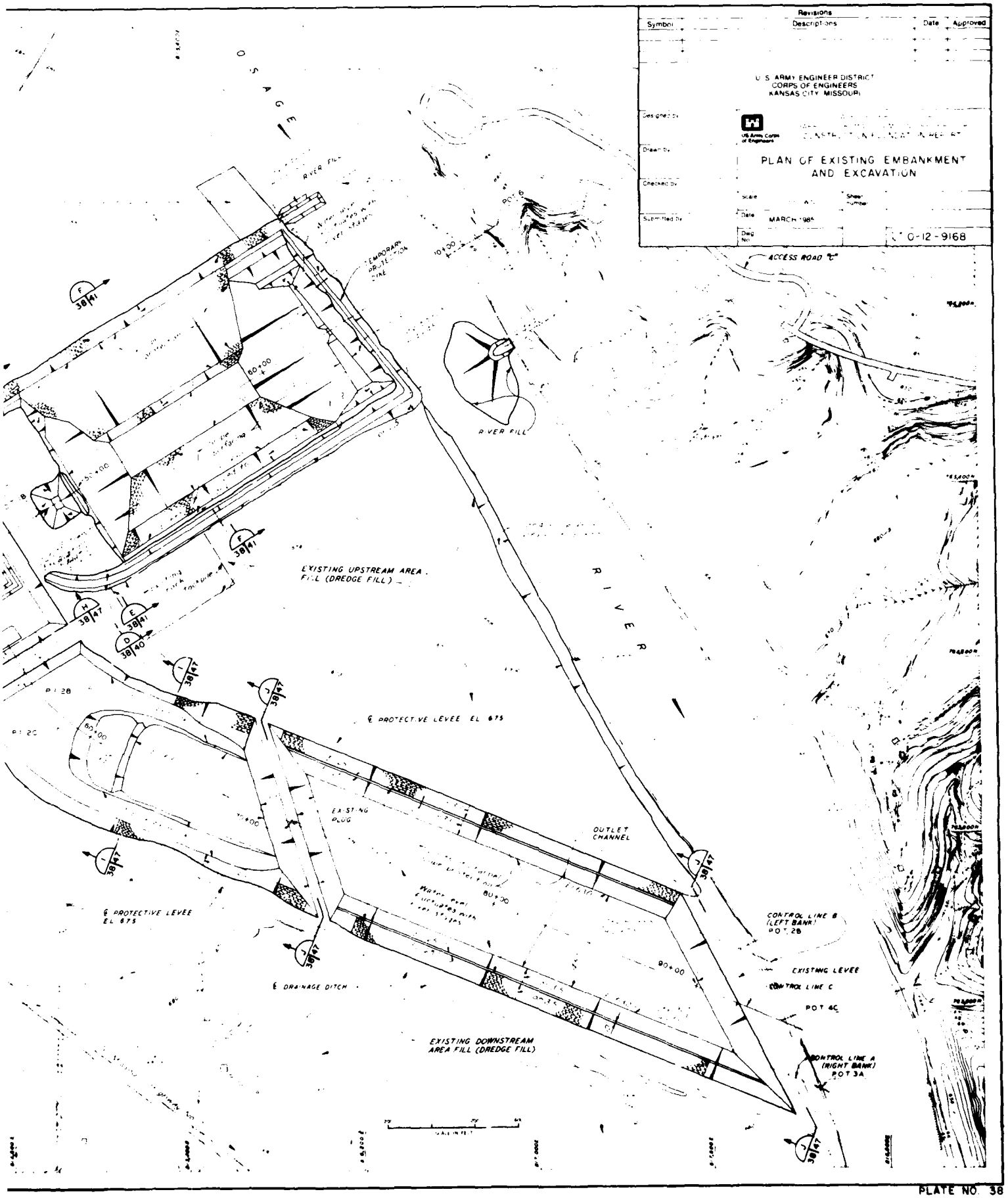
STAGE III CONSTRUCTION

TRUCTION

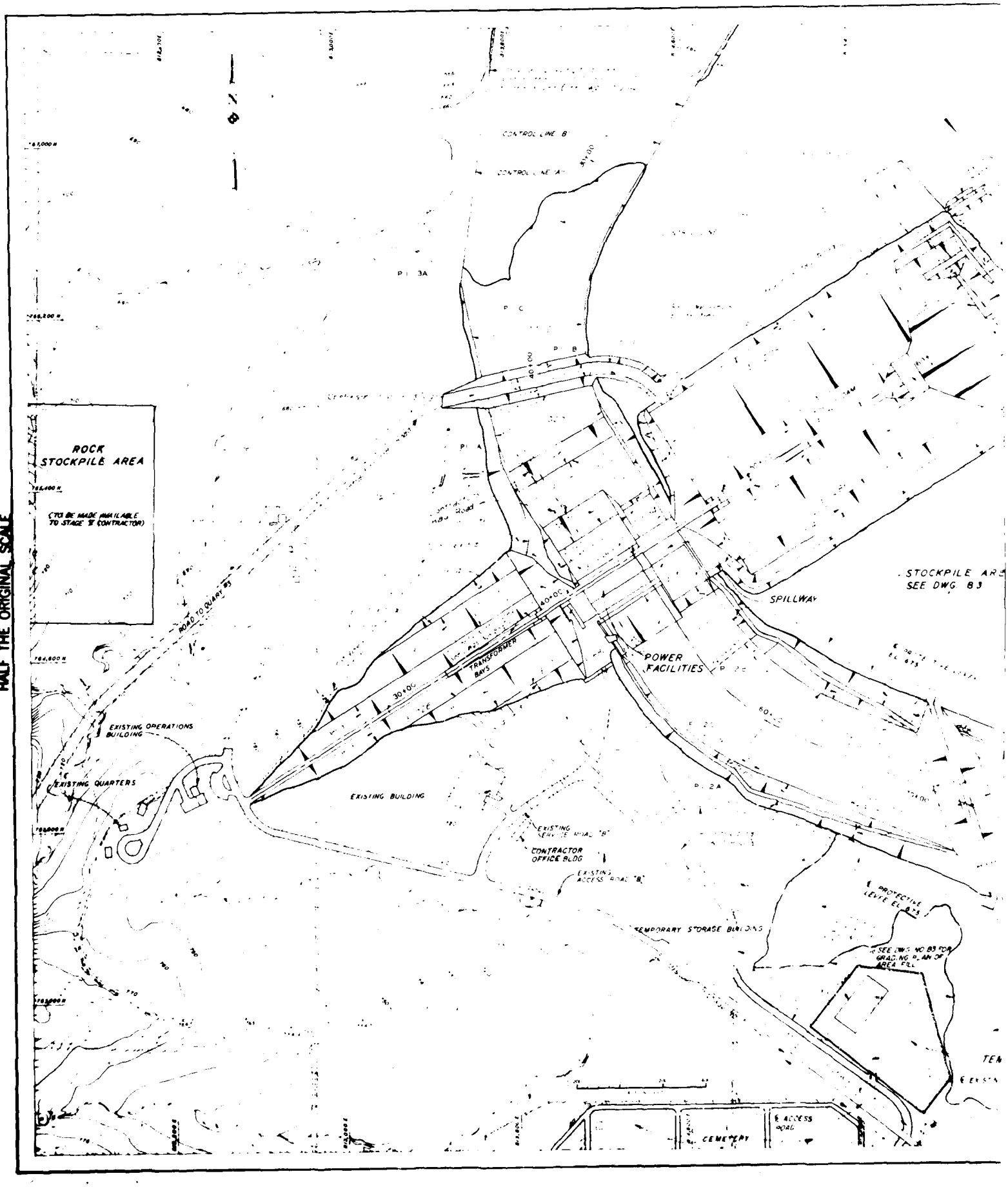
STAGE III CONSTRUCTION

HAVE BEEN REDUCED TO ONE HALF THE ORIGINAL SCALE




Revisions
Symbol
Descriptions
Date
Approved
U. S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI
Designed by
Drawn by
Checked by
Submitted by
PLAN OF EXISTING EMBANKMENT
AND EXCAVATION
Scale
Sheet number
Date
MARCH 1985
Dwg No.
0-12-9168
OSAGE
RIVER
ACCESS ROAD
TEMPORARY PROTECTION DIKE
RIVER FILL
EXISTING UPSTREAM AREA FILL (DREDGE FILL)
RIVER
℄ PROTECTIVE LEVEE EL 675
EXISTING DIKE
OUTLET CHANNEL
℄ PROTECTIVE LEVEE EL 675
CONTROL LINE B (LEFT BANK) POT 2B
EXISTING LEVEE
CONTROL LINE C
POT 4C
℄ DRAINAGE DITCH
EXISTING DOWNSTREAM AREA FILL (DREDGE FILL)
CONTROL LINE A (RIGHT BANK) POT 3A
SCALE IN FEET

HAVE BEEN REDUCED TO ONE
HALF THE ORIGINAL SCALE



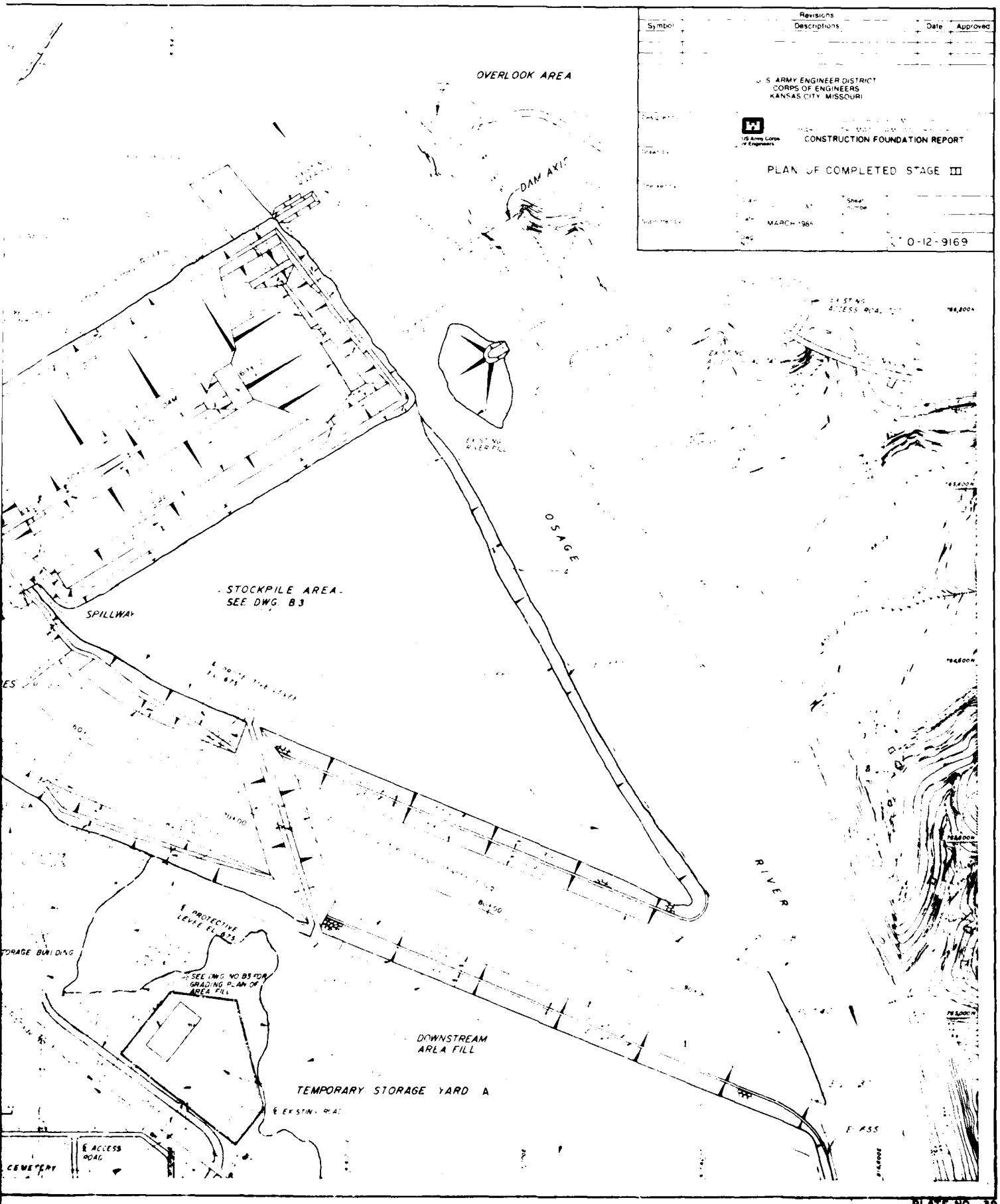
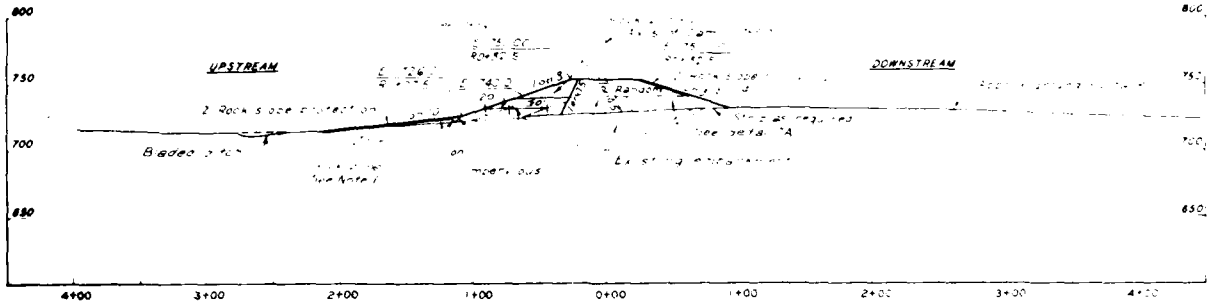

Revisions
Symbol
Descriptions
Date
Approved
U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI
CONSTRUCTION FOUNDATION REPORT
PLAN OF COMPLETED STAGE III
MARCH 1985
0-12-9169
OVERLOOK AREA
DAM AXIS
OSAGE
RIVER
STOCKPILE AREA
SEE DWG. B3
SPILLWAY
PROTECTIVE LEVEE EL. 875
SEE DWG. NO. B3 FOR GRADING PLAN OF AREA FILL
DOWNSTREAM AREA FILL
TEMPORARY STORAGE YARD A
ACCESS ROAD
CEMETERY

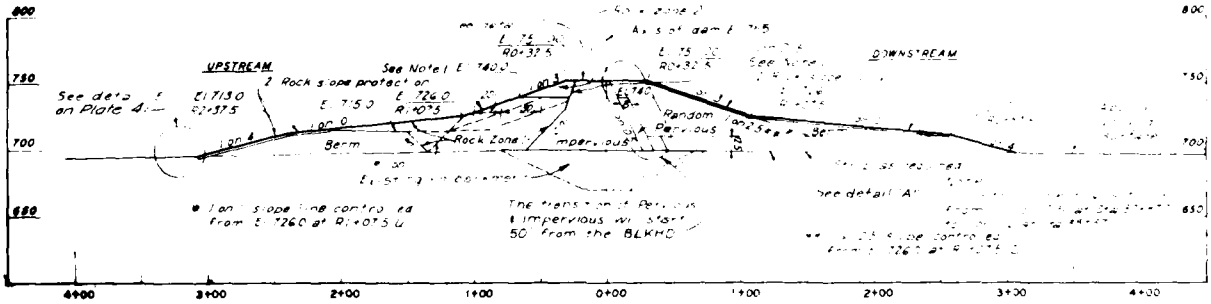
PLATE NO. 39



TYPICAL SECTION, RIGHT ABUTMENT

SECTION (A) AT STA. 29+00±

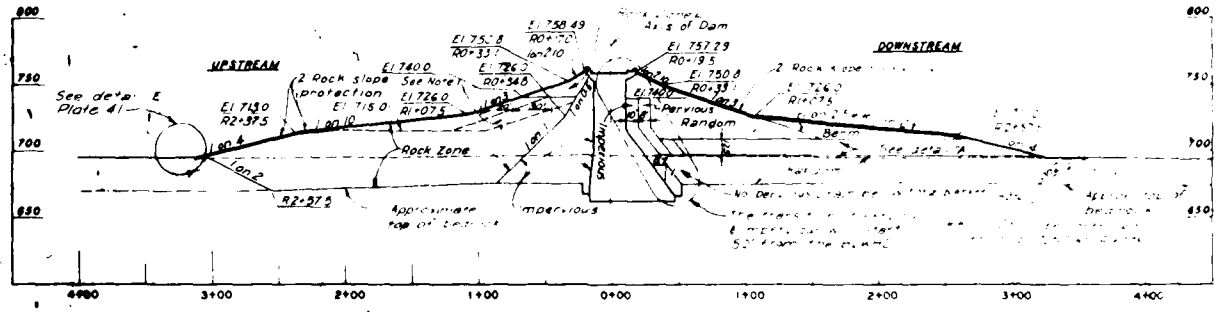
38|40



TYPICAL SECTION, RIGHT ABUTMENT

SECTION (B) AT STA. 37+00±

38|40

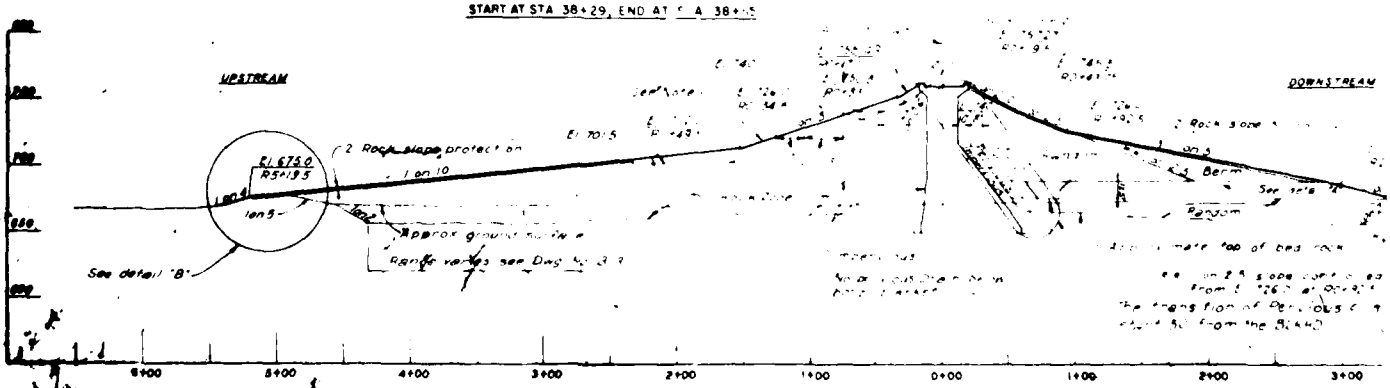


TYPICAL SECTION WEST BULKHEAD

SECTION (C) AT STA. 38+45±

38|40

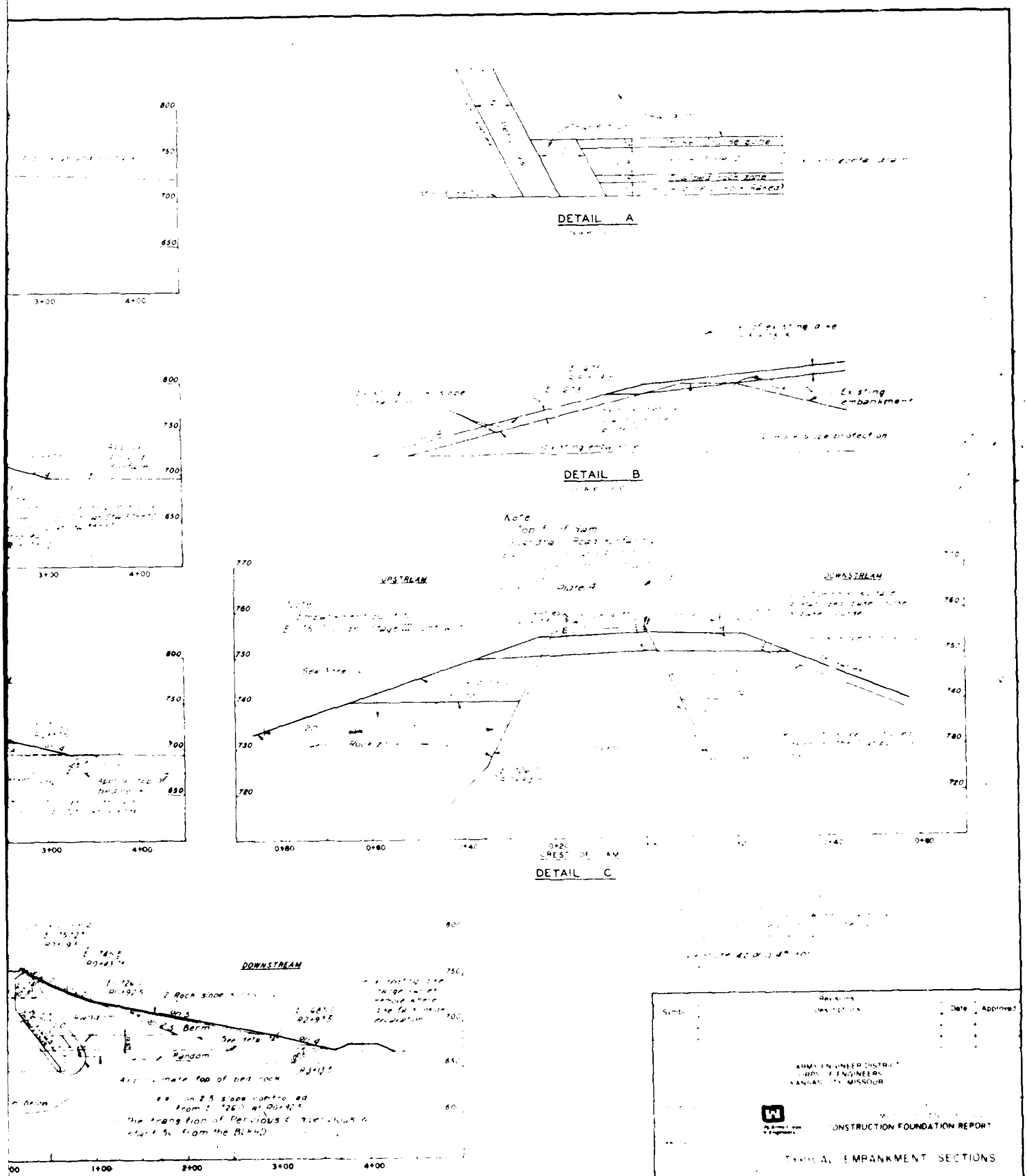
START AT STA 38+29, END AT STA 38+65



TYPICAL SECTION EAST BULKHEAD

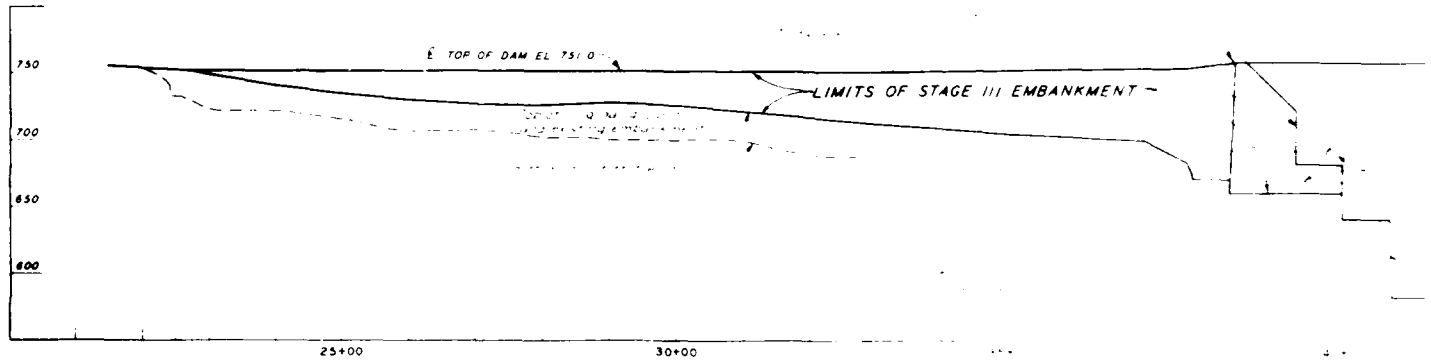
SECTION (D) AT STA. 47+95±

38|40

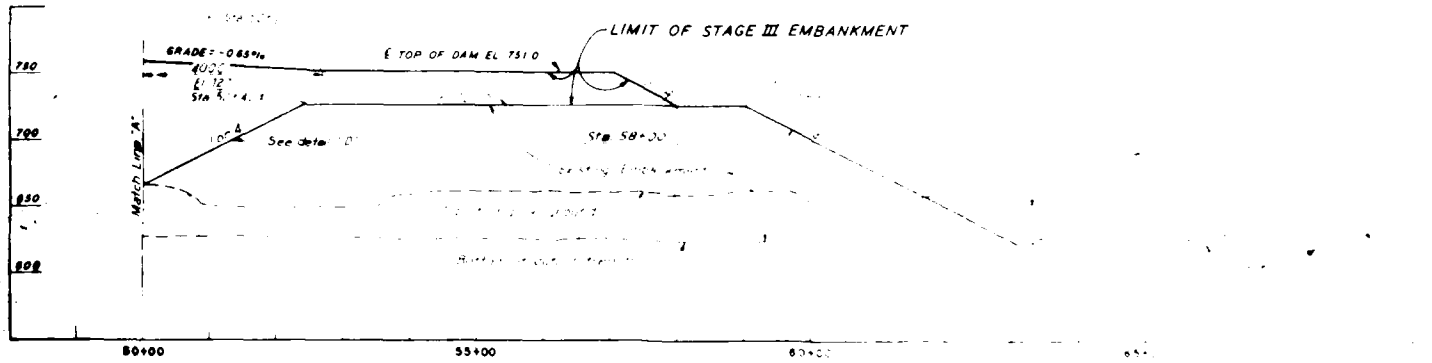


DRAWINGS IN THIS FOLIO HAVE BEEN REDUCED TO ONE HALF THE ORIGINAL SCALE

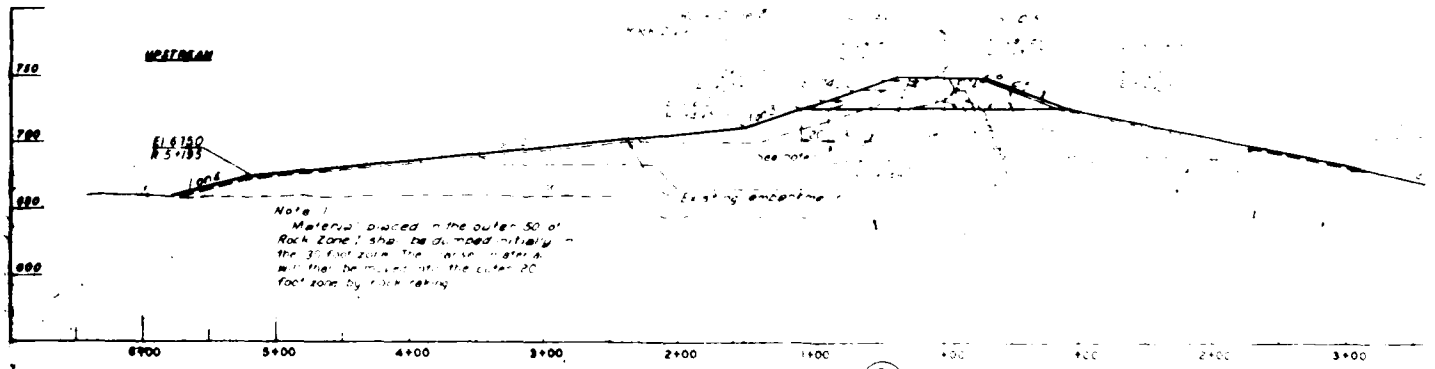
PLATE NO 40



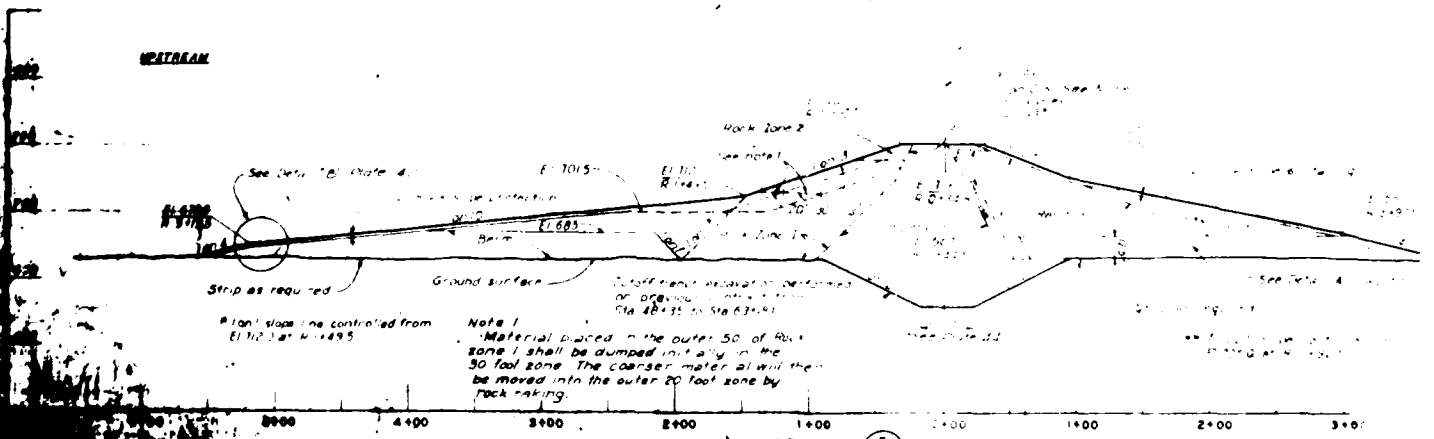
DAM AXIS PROFILE-LOOKING UPSTREAM



DAM AXIS PROFILE-LOOKING UPSTREAM



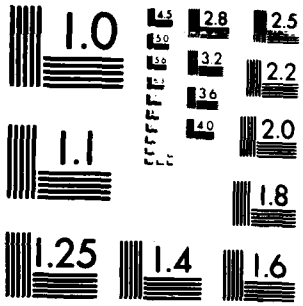
SECTION F AT STA 55+00



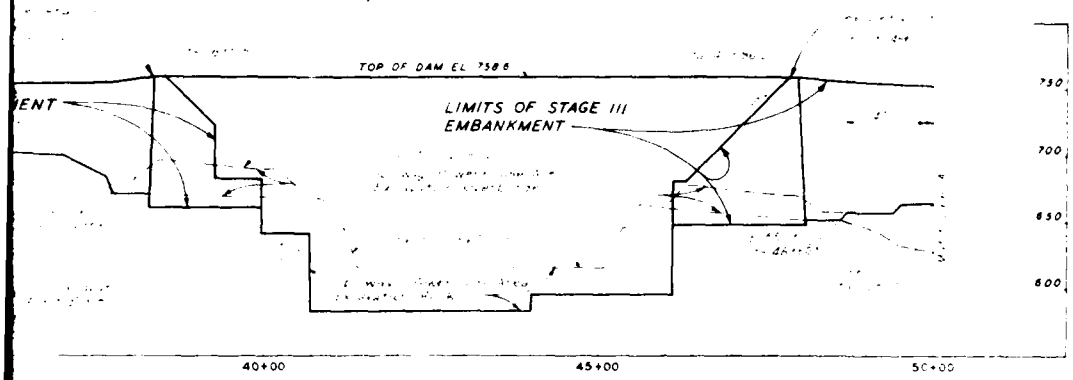
SECTION E AT STA 48+55

AD-A154 456 OSAGE RIVER BASIN OSAGE RIVER MISSOURI HARRY S TRUMAN DAM & RESERVOIR MU..(U) CORPS OF ENGINEERS KANSAS CITY MO KANSAS CITY DISTRICT R F GRIFFITH ET AL. 1984 2/4

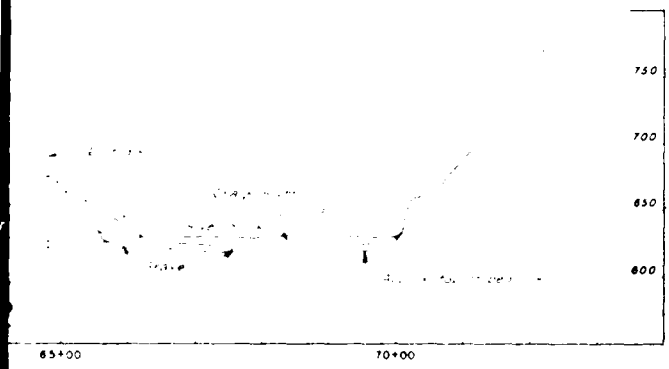
UNCLASSIFIED F/G 13/13 NL

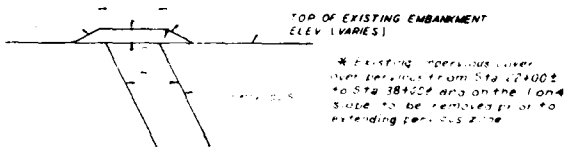


MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS 1963-A

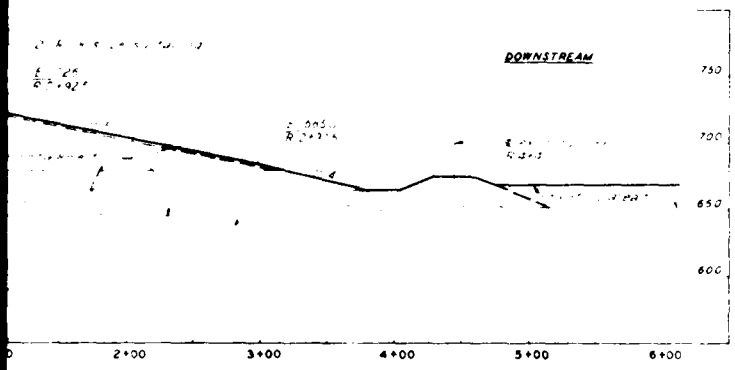


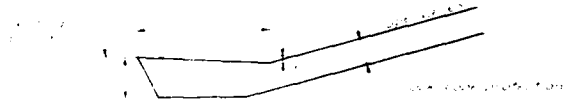
OKING UPSTREAM





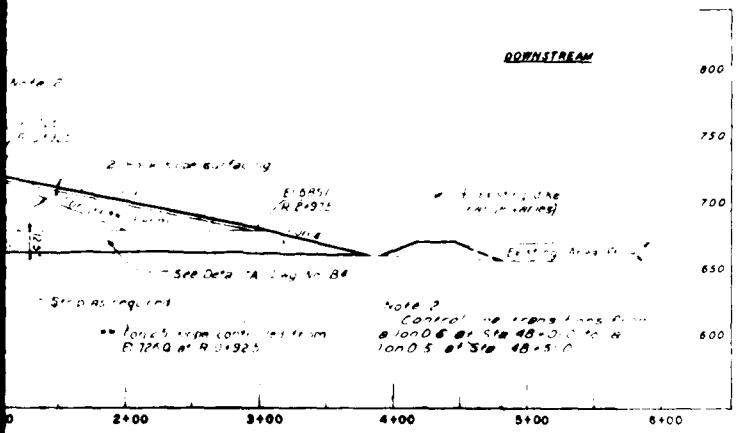
DETAIL "D"

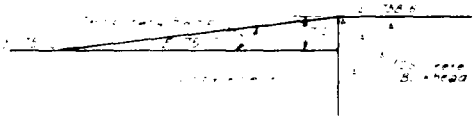




DETAIL "E"
TOE TRENCH DETAIL

DRAWINGS IN THIS FOLIO HAVE BEEN REDUCED TO ONE HALF THE ORIGINAL SCALE





DETAIL "F"

Symbol	Revisions Descriptions	Date	Approved

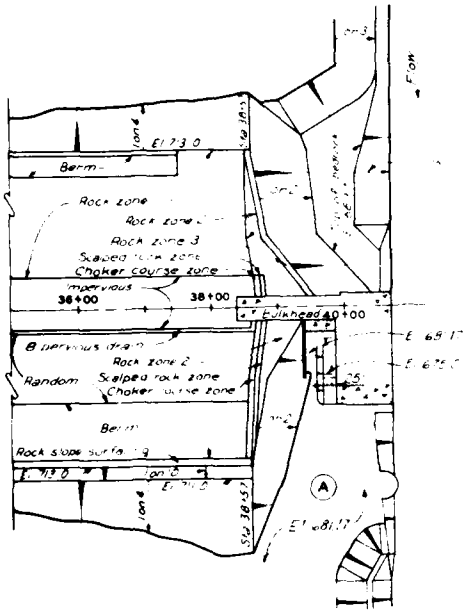
U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

CONSTRUCTION FOUNDATION REPORT

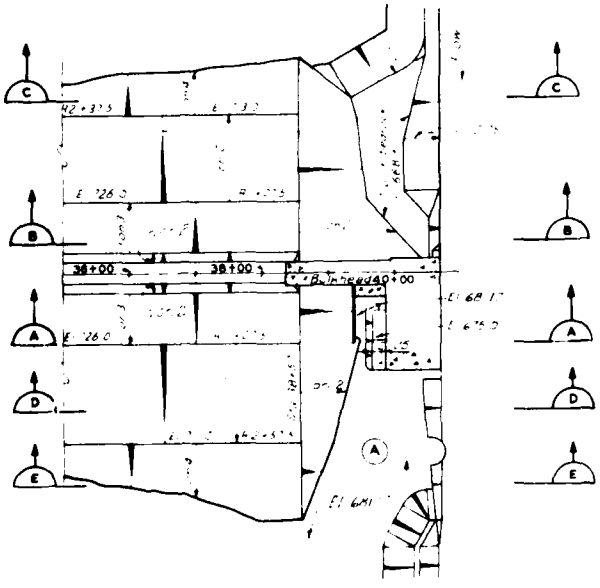
EMBANKMENT SECTIONS AND PROFILE

Scale
Date MARCH 1985
Sheet number
Drawing No. 0-12-9171

PLATE NO. 41



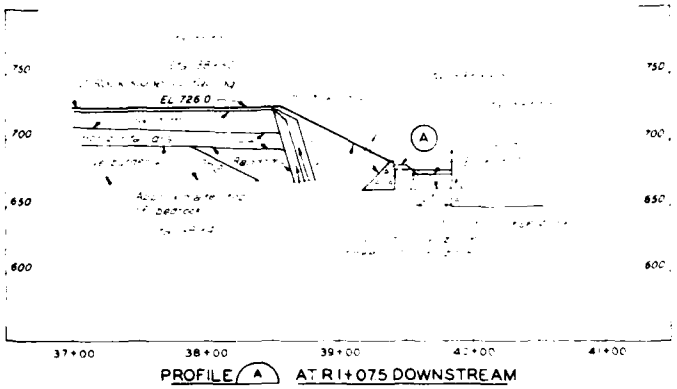
BULKHEAD - FILL TIE - IN
PLAN OF FILL AT EL 713.0



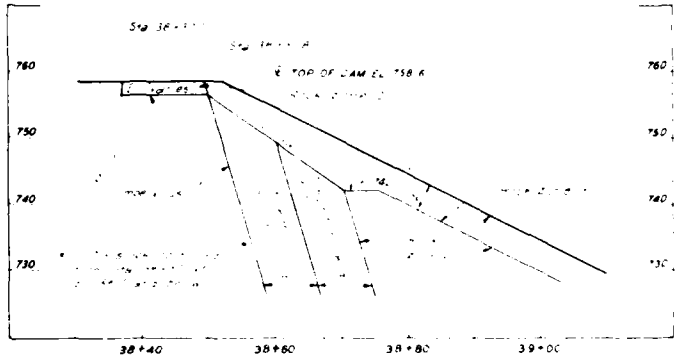
(A) BULKHEAD - FILL TIE - IN

DRAWINGS IN THIS FOLIO HAVE BEEN REDUCED TO ONE HALF THE ORIGINAL SCALE

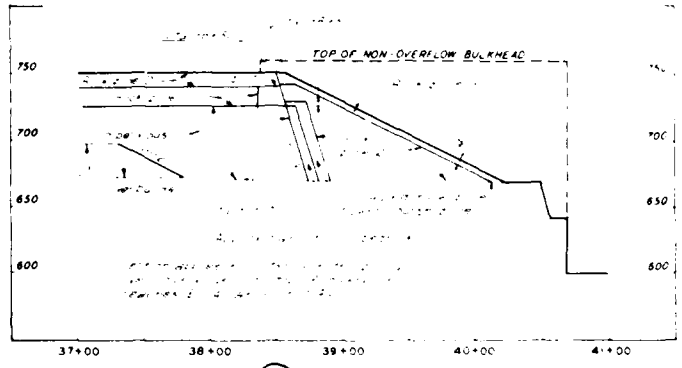
ELEVATION IN FEET ABOVE MEAN SEA LEVEL



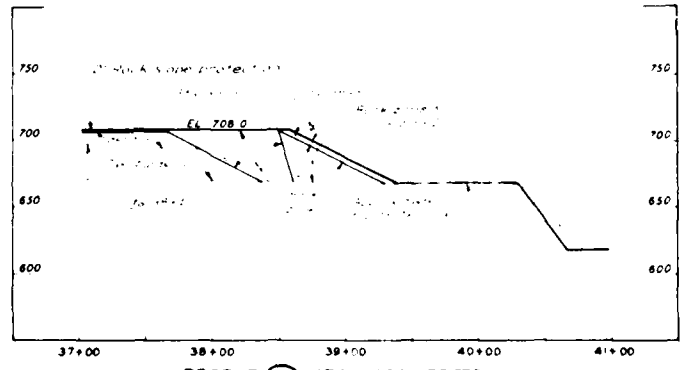
PROFILE (A) AT R 1+07.5 DOWNSTREAM



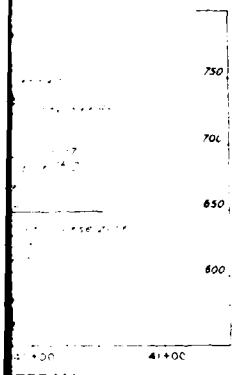
PROFILE - CREST DETAIL - BULKHEAD FILL TIE - IN
R 0+17.0 TO R 0+26.4 UPSTREAM



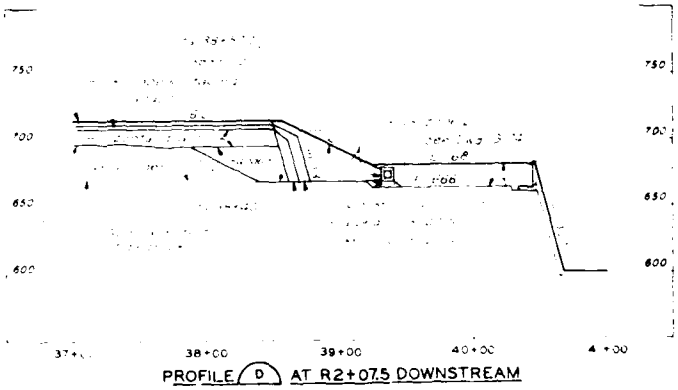
PROFILE (B) AT R 0+34.8 UPSTREAM



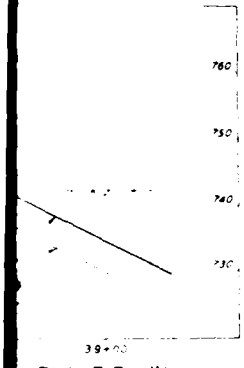
PROFILE (C) AT R 2+57.5 UPSTREAM



TREAM

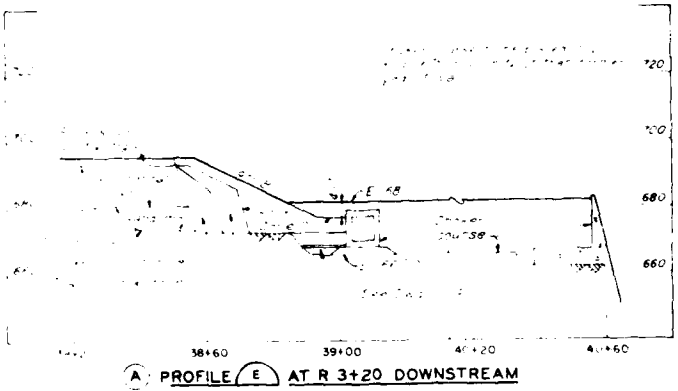


PROFILE (D) AT R2+07.5 DOWNSTREAM

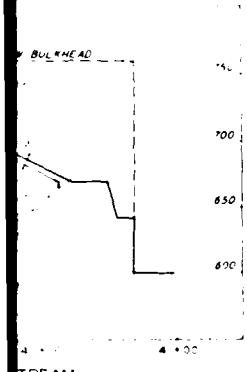


FILL TIE - IN

REAM

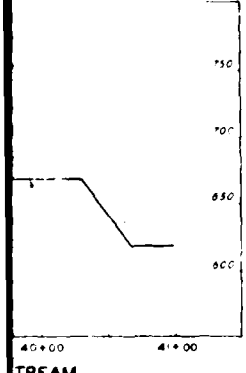


(A) PROFILE (E) AT R 3+20 DOWNSTREAM

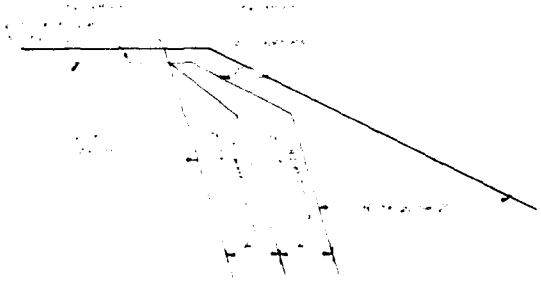


TREAM

(A) PROFILE NORMAL TO TAILRACE WINGWALL



TREAM



DOWNSTREAM ZONING DETAILS

SCALE IN FEET

from RO+12.0 to RO+17.0

downstream

Revisions			
Symbol	Descriptions	Date	Approved

U S ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY MISSOURI

US Army Corps of Engineers

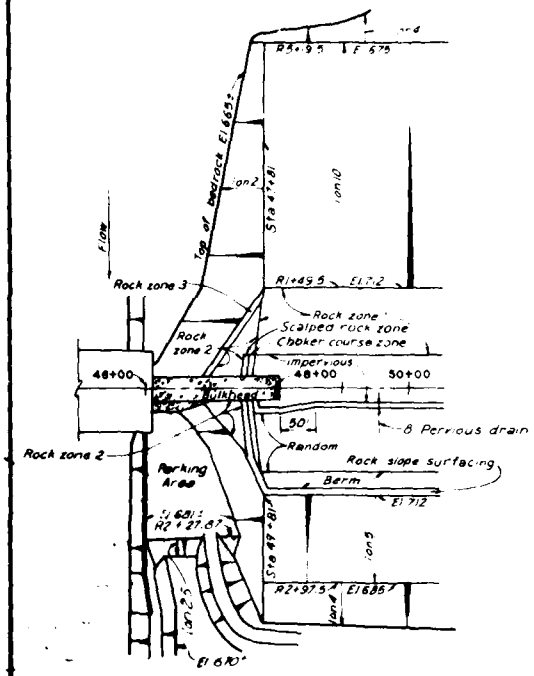
OSAGE RIVER MISSOURI
HARRY S TRUMAN DAM AND RESERVOIR
CONSTRUCTION FOUNDATION REPORT

WEST NON-OVERFLOW BULKHEAD
FILL TIE-IN

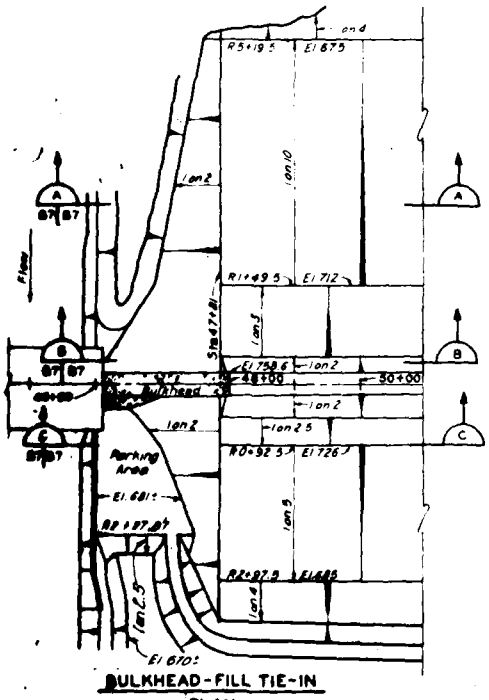
Designed by
Drawn by
Checked by
Submitted by

Scale
Date MARCH 1985
Drawing No
Sheet number
File No 0-12-9172

PLATE NO 42

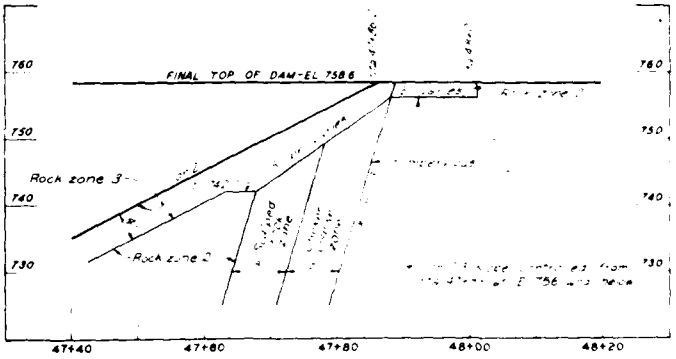


BULKHEAD-FILL TIE-IN
PLAN OF FILL AT EL. 712

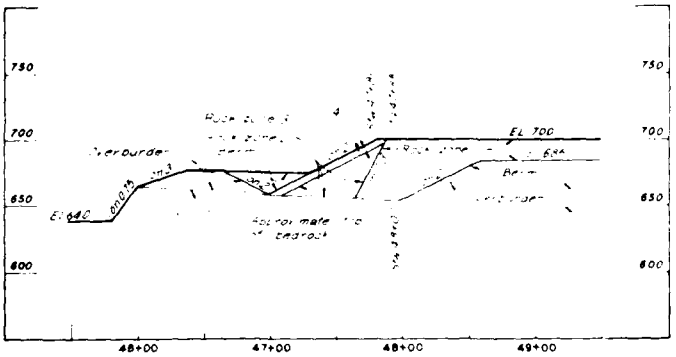


BULKHEAD-FILL TIE-IN
PLAN

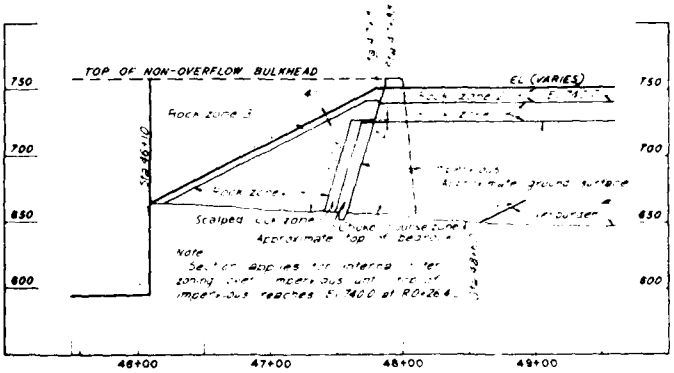
ELEVATION IN FEET ABOVE MEAN SEA LEVEL



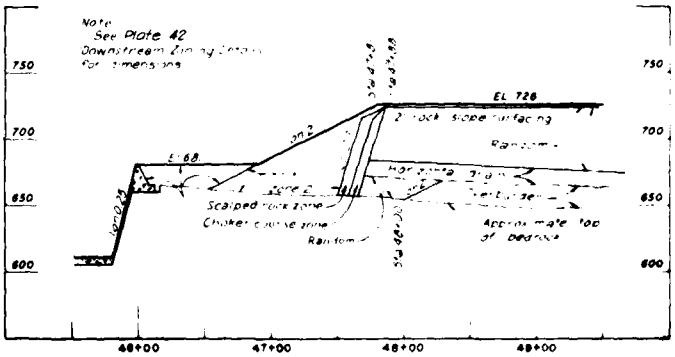
PROFILE - CREST DETAIL - BULKHEAD FILL TIE-IN
R0+17.0 TO R0+26.4 UPSTREAM



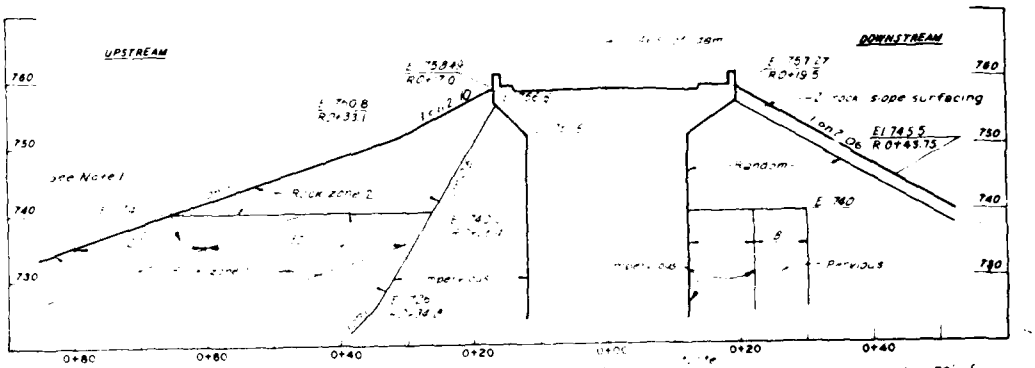
PROFILE (A) AT R2+69.5 UPSTREAM



PROFILE (B) AT R0+34.8 UPSTREAM

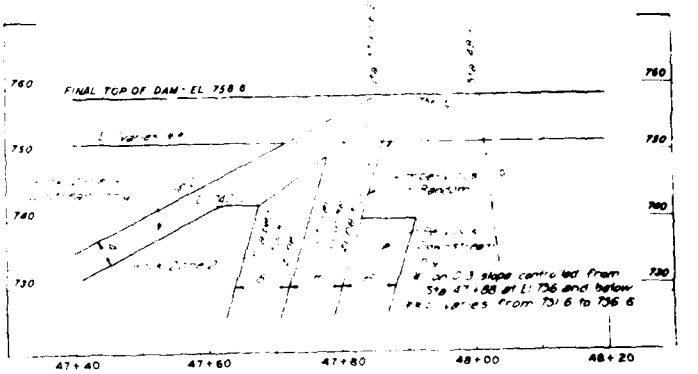


PROFILE (C) AT R0+92.5 DOWNSTREAM



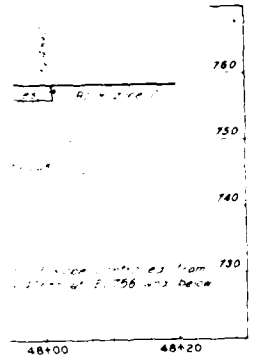
SECTION AT BULKHEAD
*STA. 47+88.0 TO 48+01.0
**STA. 38+37.0 TO 38+50.0

Where a placed in the outer 50' of ... shall be dumped initially in the 30 foot zone. The coarser material will then be moved into the outer 20 foot zone by rock raking.
* Applicable U/S and D/S
** Applicable are U/S but not D/S

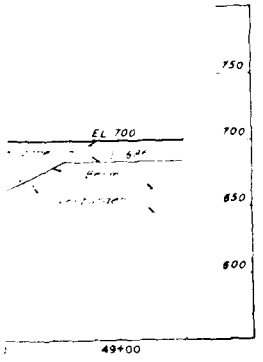


PROFILE - CREST DETAIL - BULKHEAD FILL TIE-IN
R0+12.0 TO R0+17.0 UPSTREAM
R0+12.0 TO R0+19.5 DOWNSTREAM

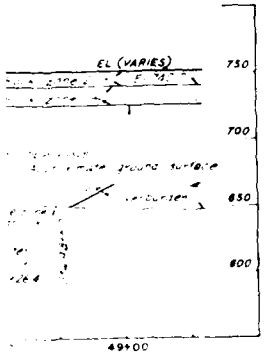
Note: for excavation plan, see Plate 44



D FILL TIE-IN
REAM



PSTREAM



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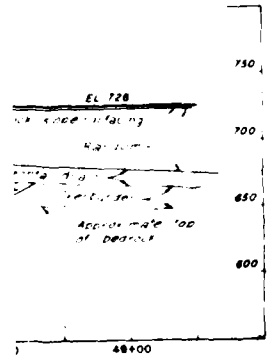


WNSTREAM

DRAWINGS IN THIS FOLIO
HAVE BEEN REDUCED TO ONE
HALF THE ORIGINAL SCALE

Symbol	Revisions Descriptions	Date	Approved

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

Designed by
Drawn by
Traced by
Submitted by

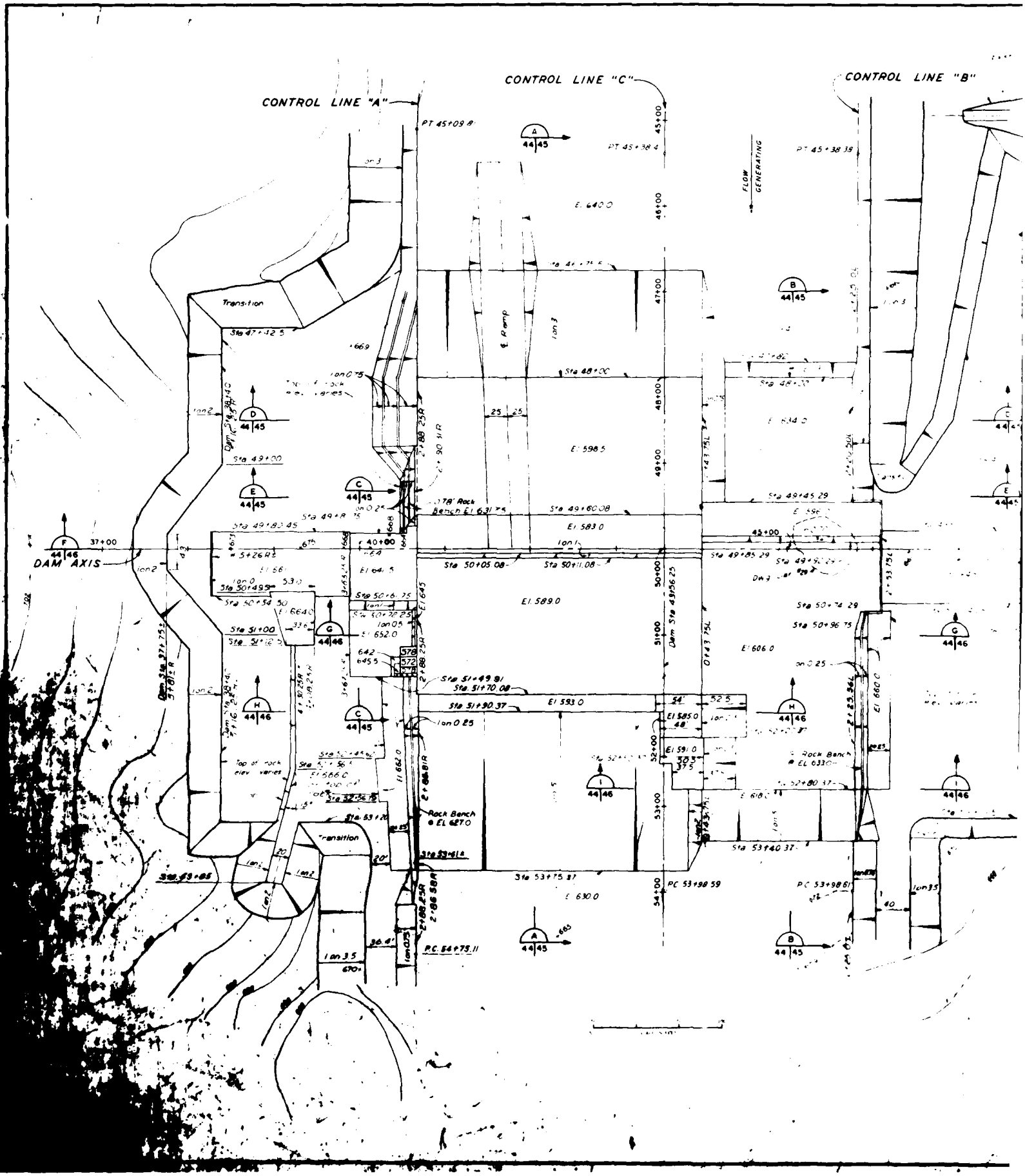
US Army Corps of Engineers

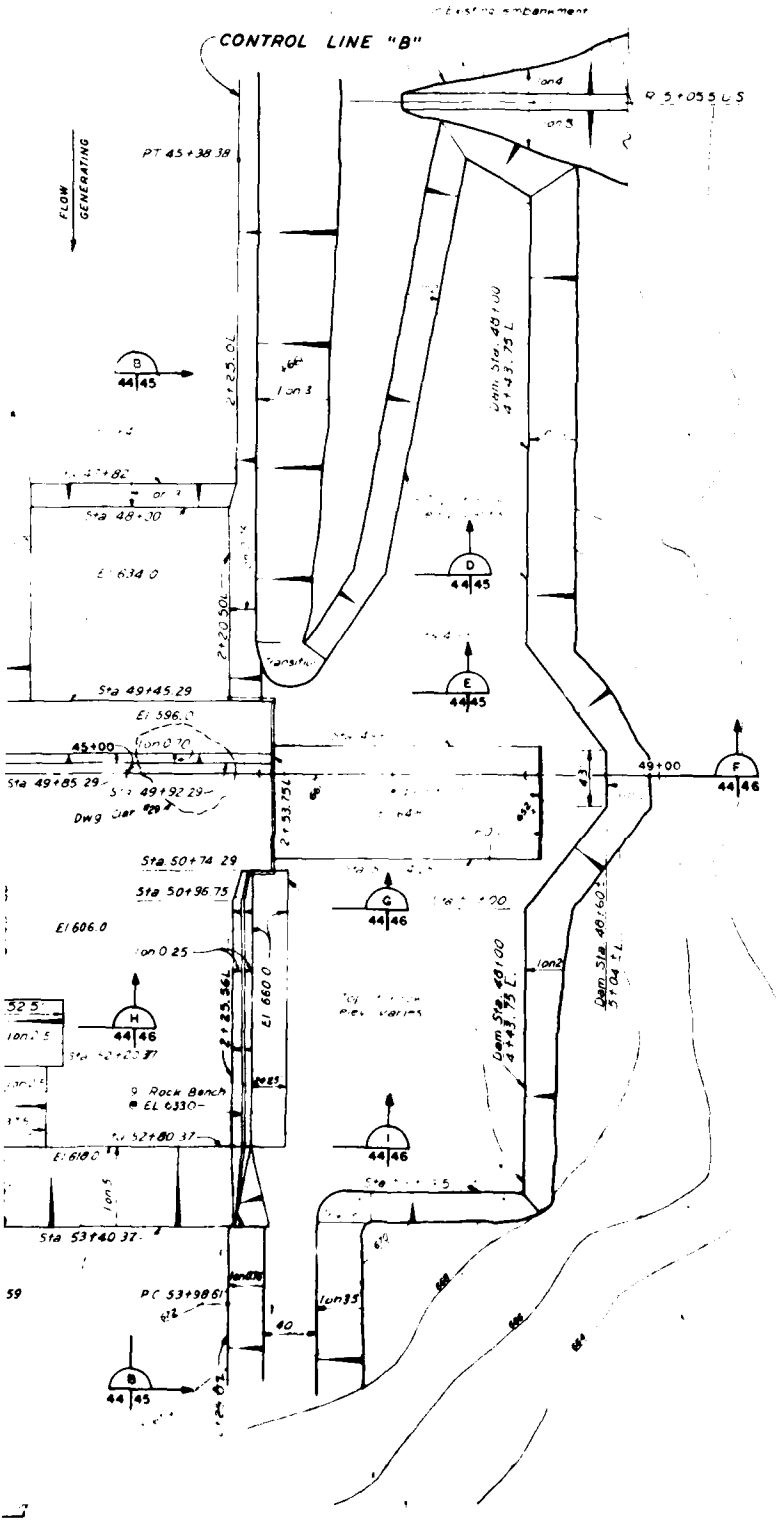
CONSTRUCTION FOUNDATION REPORT

EAST NON-OVERFLOW BULKHEAD
FILL TIE-IN

Scale
Date: MARCH 1985
Dwg No.
Sheet number
File No. 0-12-9173

PLATE NO. 43


CONTROL LINE "A"
CONTROL LINE "C"
CONTROL LINE "B"
DAM AXIS
FLOW GENERATING
Transition
Rock Bench
Top of rock elev. varies
Sta 47+42.5
Sta 48+00
Sta 49+00
Sta 49+45.29
Sta 50+05.08
Sta 50+11.08
Sta 50+74.29
Sta 50+96.75
Sta 51+00
Sta 51+49.91
Sta 51+70.08
Sta 51+90.37
Sta 52+80.37
Sta 53+40.37
Sta 53+75.37
Sta 53+98.59
P.C. 54+75.11
P.C. 53+98.61
PT 45+09.8
PT 45+38.4
PT 45+38.38
El. 640.0
El. 598.5
El. 583.0
El. 589.0
El. 593.0
El. 606.0
El. 660.0
El. 630.0
El. 634.0
El. 652.0
El. 664.0
El. 666.0
El. 661.0
El. 645.5
El. 591.0
El. 585.0
Rock Bench @ EL 6270
Rock Bench @ EL 6330



DRAWINGS IN THIS FOLIO
HAVE BEEN REDUCED TO ONE
HALF THE ORIGINAL SCALE

Revisions			
Symbol	Descriptions	Date	Approved

U S ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY MISSOURI

US Army Corps of Engineers

CONSTRUCTION FOUNDATION REPORT

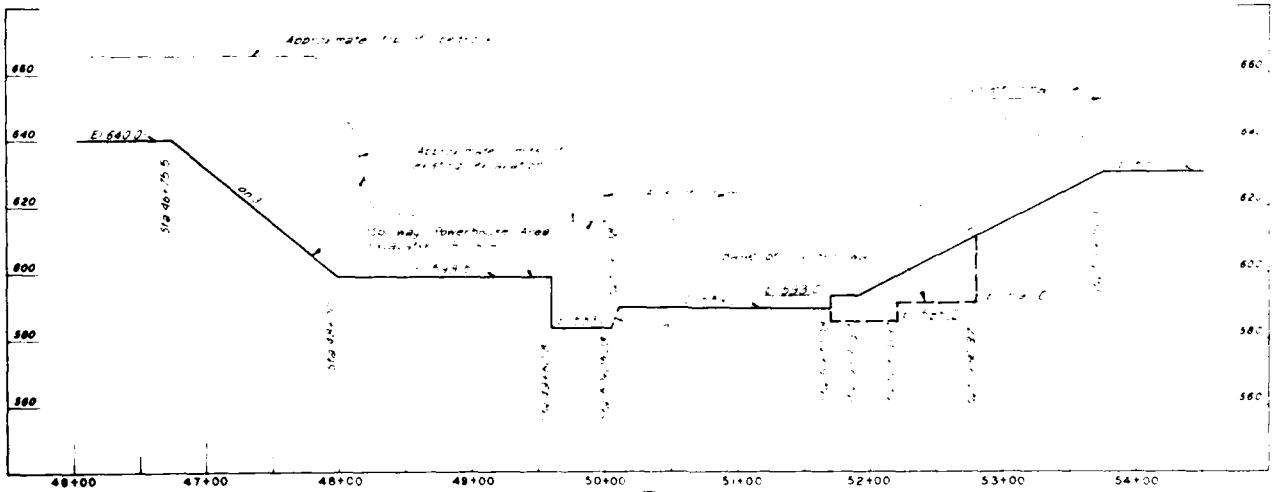
SPILLWAY - POWERHOUSE EXCAVATION PLAN

Designed by
Drawn by
Checked by
Submitted by

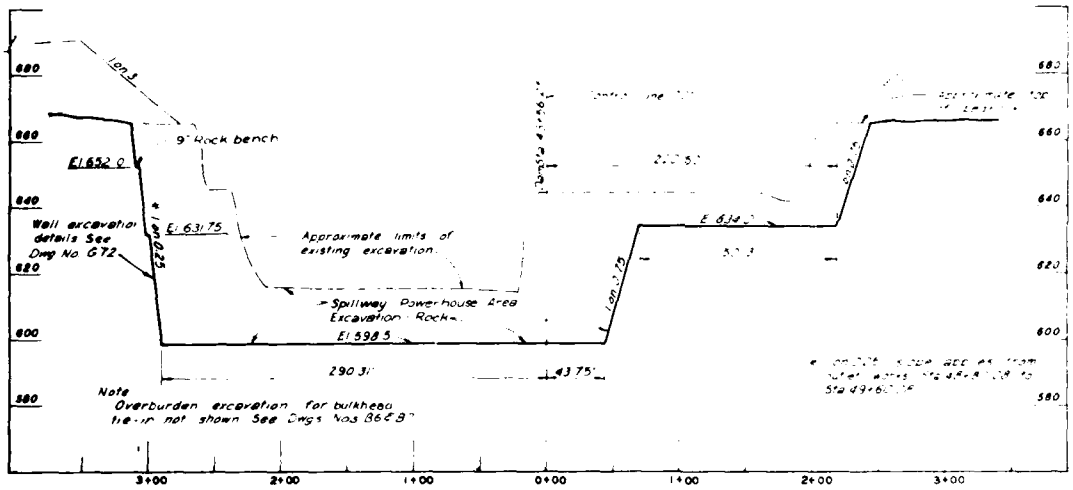
Scale AS SHOWN
Date MARCH 1985
Dwg No
Sheet number
F No 0-12-9174

PLATE NO 44

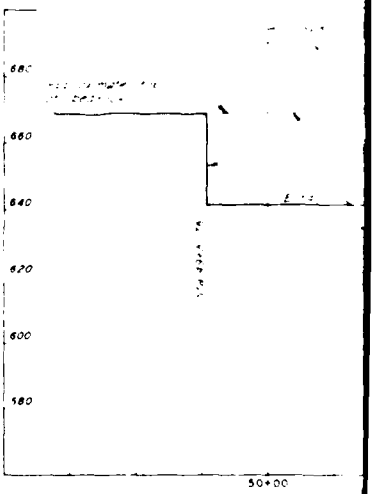
ELEVATIONS IN FEET ABOVE MEAN SEA LEVEL



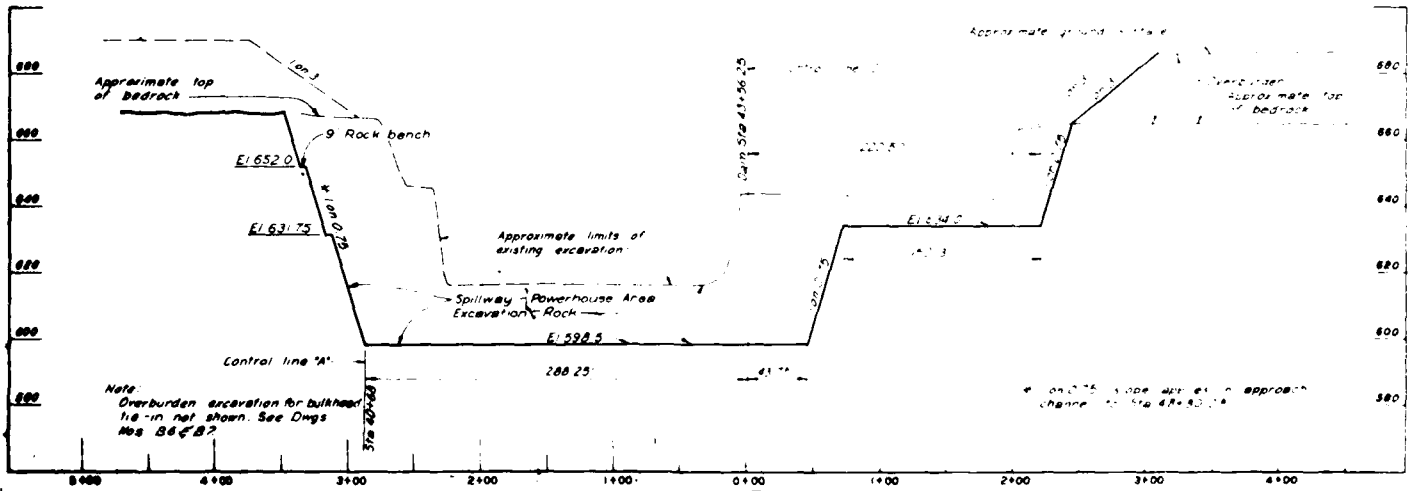
POWERHOUSE PROFILE (A) AT RANGE 1+50R
44|45



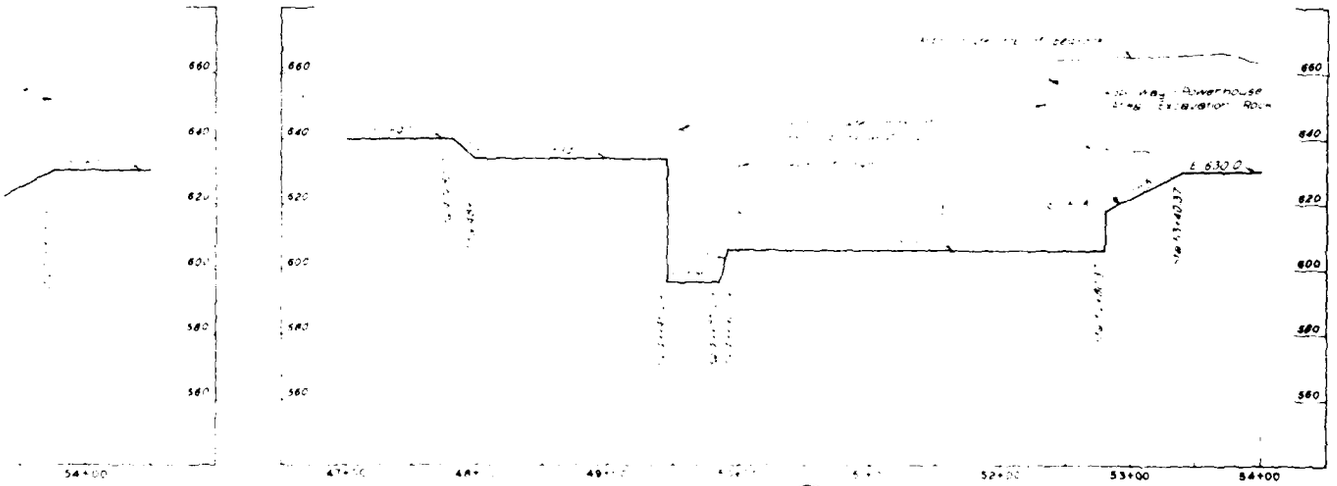
OUTLET WORKS SECTION (E) AT STA. 49+40
44|45



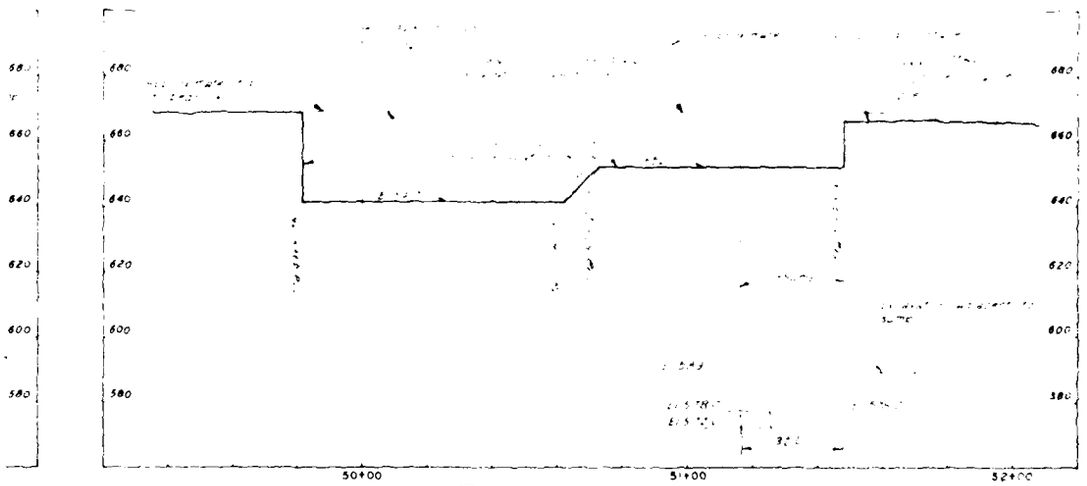
SERVICE BAY PROFILE



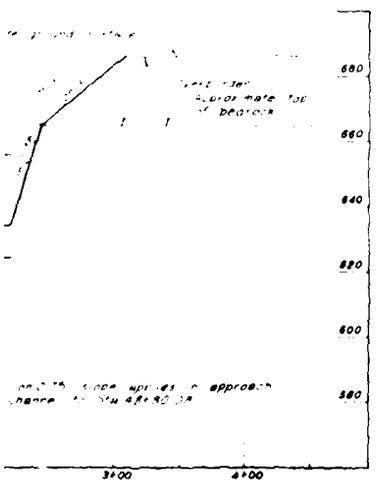
OUTLET WORKS SECTION (D) AT STA. 48+50
44|45



SPILLWAY PROFILE (B) AT RANGE 1+50L
44 45



SERVICE BAY PROFILE (C) AT RANGE 3+25R AND SUMP AT RANGE 2+88.25R
44 45



NOTES
For plan of excavation, see Plate 44.
Existing scale and grades are approximate

DRAWINGS IN THIS FOLIO
HAVE BEEN REDUCED TO ONE
HALF THE ORIGINAL SCALE

Symbol	Revisions Descriptions	Date	Approved

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

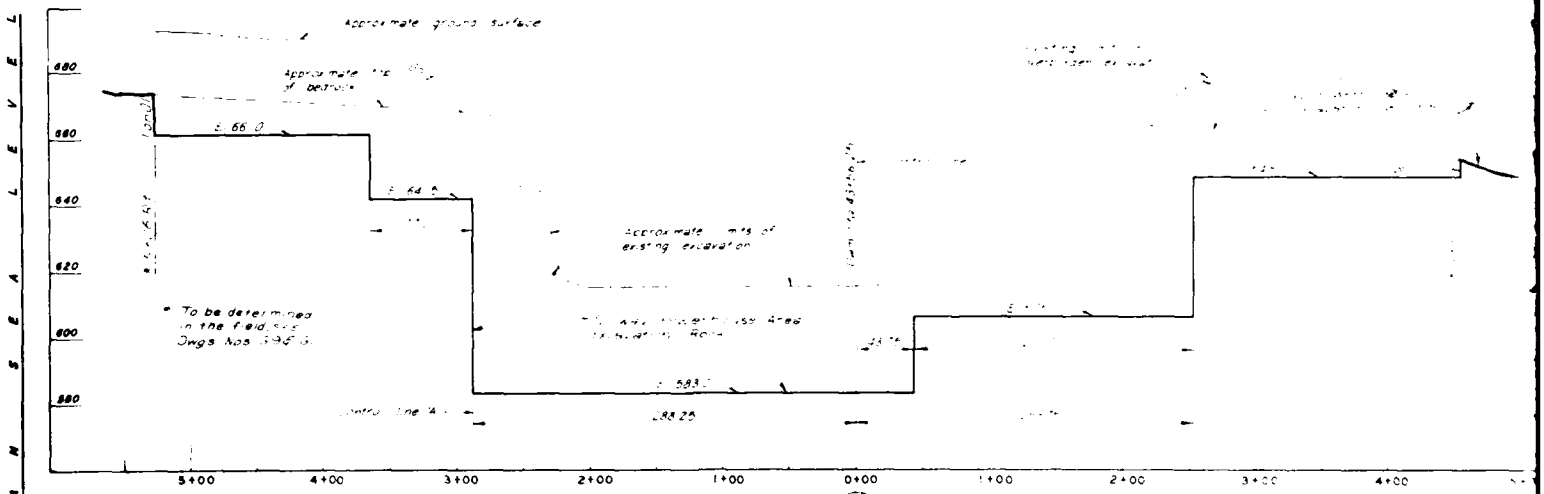
US Army Corps of Engineers

CONSTRUCTION FOUNDATION REPORT

SPILLWAY-POWERHOUSE EXCAVATION
SECTIONS AND PROFILES

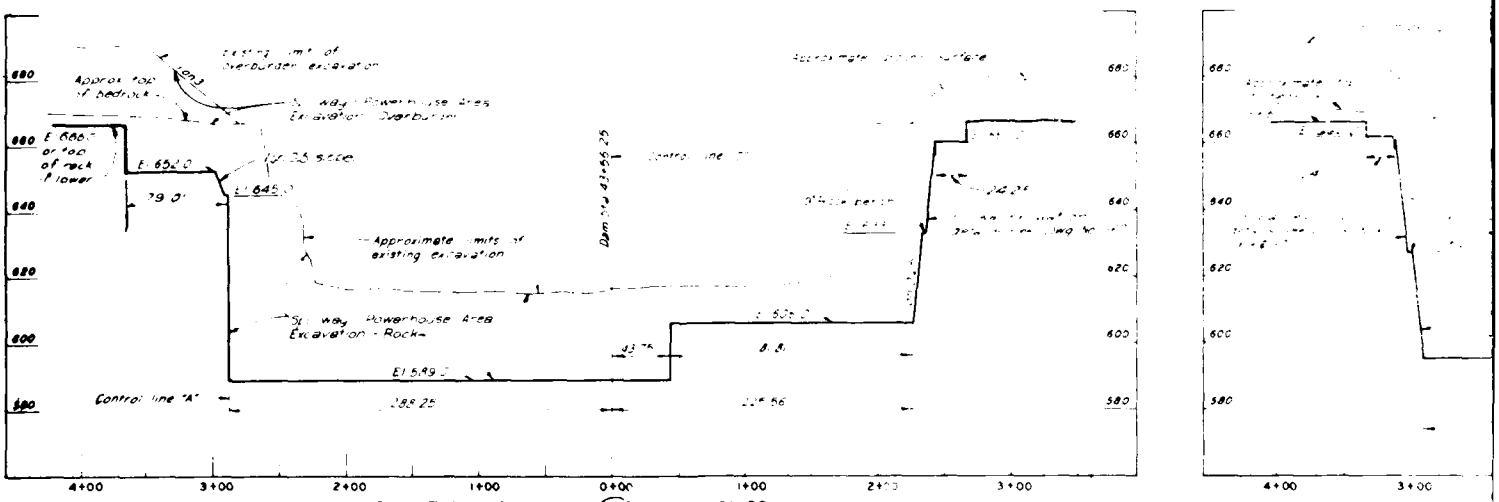
Scale
Date MARCH 1985
Sheet number
Dwg. No. 0-12-9175

PLATE NO 45



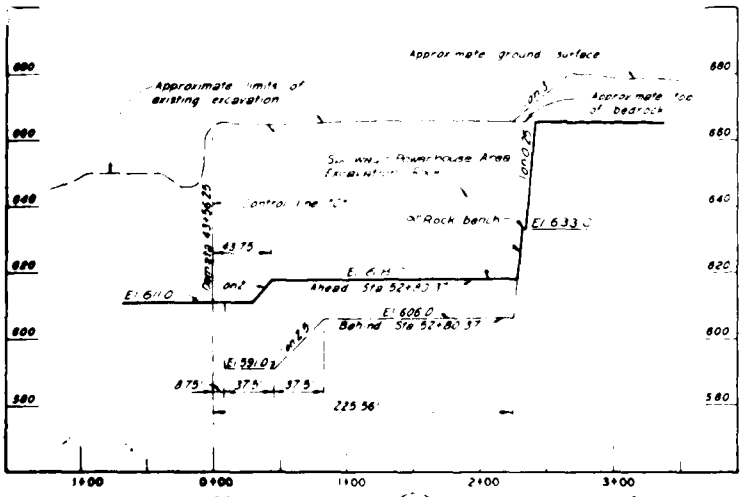
OUTLET WORKS SECTION (F) AT STA 50+00

44 | 46



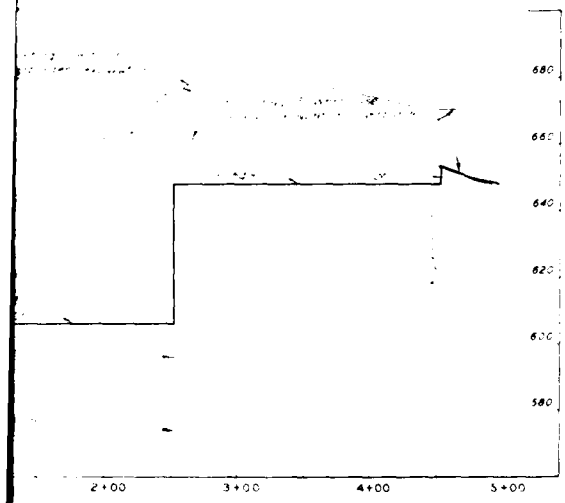
OUTLET WORKS SECTION (G) AT STA 51+00

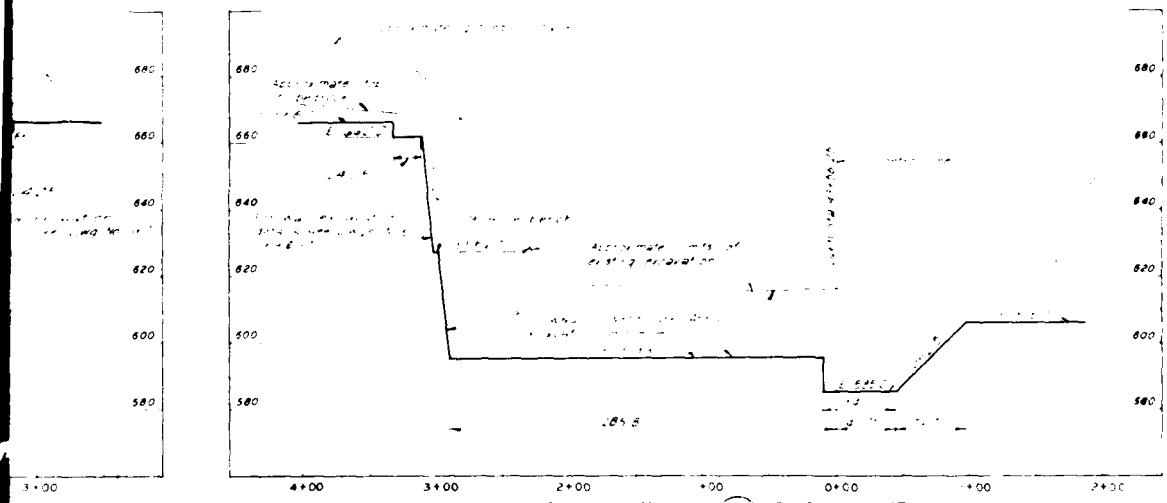
44 | 46



OUTLET WORKS SECTION (I) AT STA 52+80.37

44 | 46





OUTLET WORKS SECTION (H) AT STA 51+90.37

44 | 46

See Plate 44.
See Plates 42 & 45.

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Symbol	Revisions Descriptions	Date	Approved

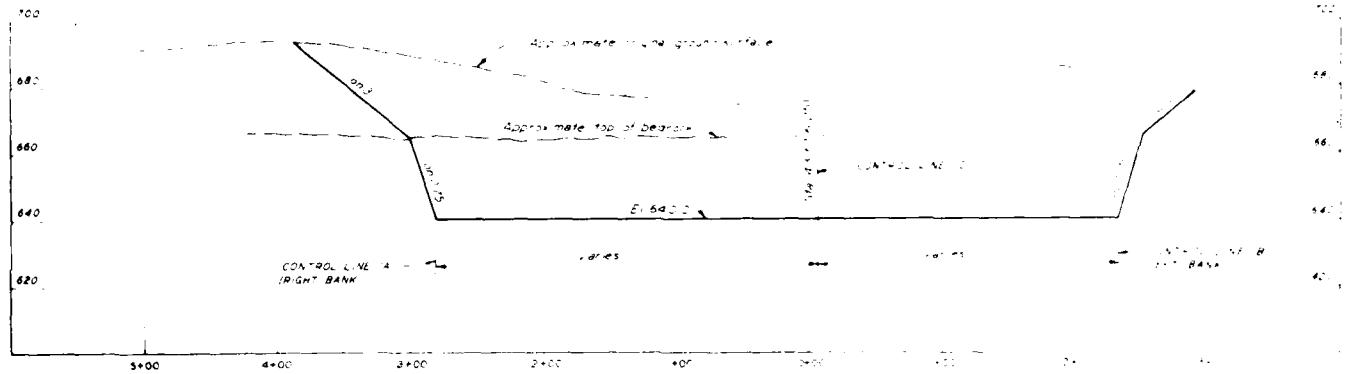
U. S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

US Army Corps of Engineers

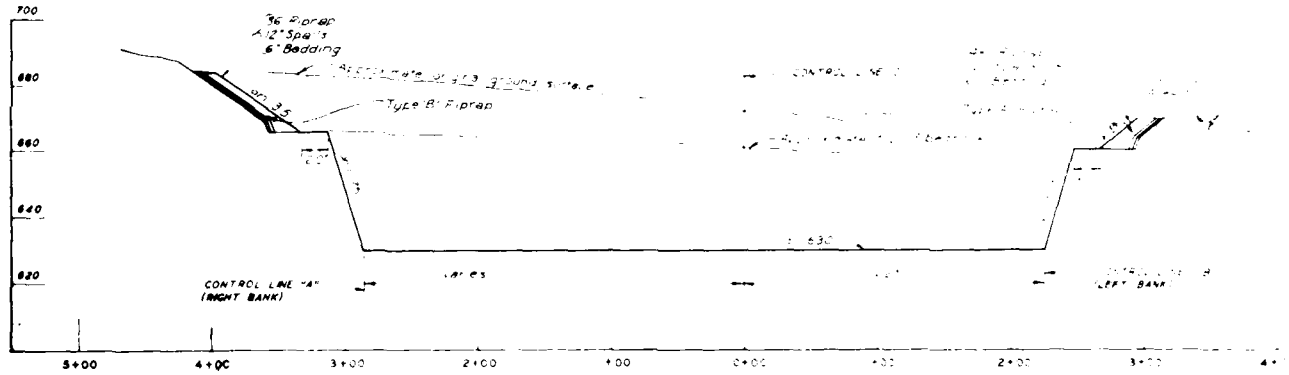
CONSTRUCTION FOUNDATION REPORT

SPILLWAY - POWERHOUSE
EXCAVATION SECTIONS

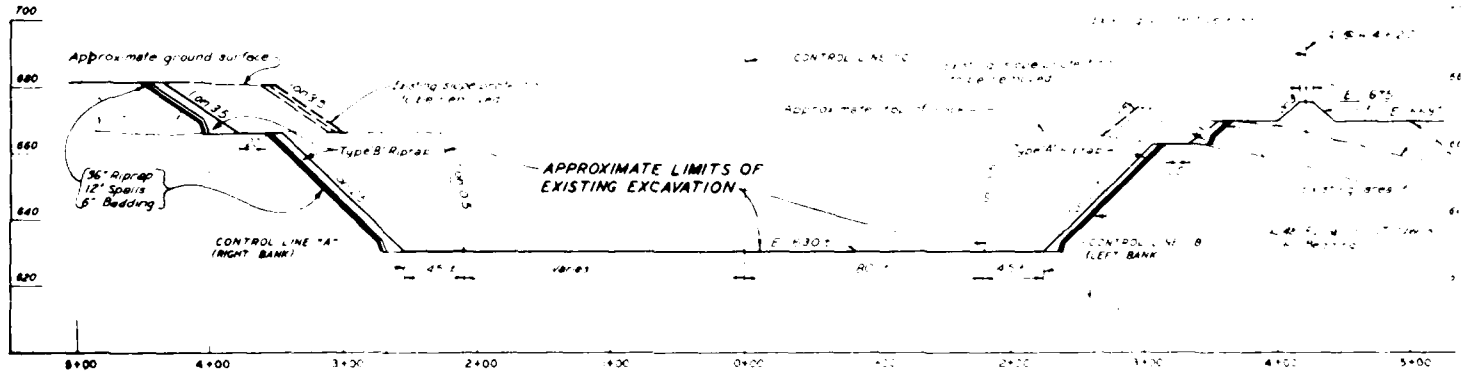
Scale: 1" = 20'-0"
Sheet Number:
Date: MARCH 1965
Dwg No.: 0-12-9176



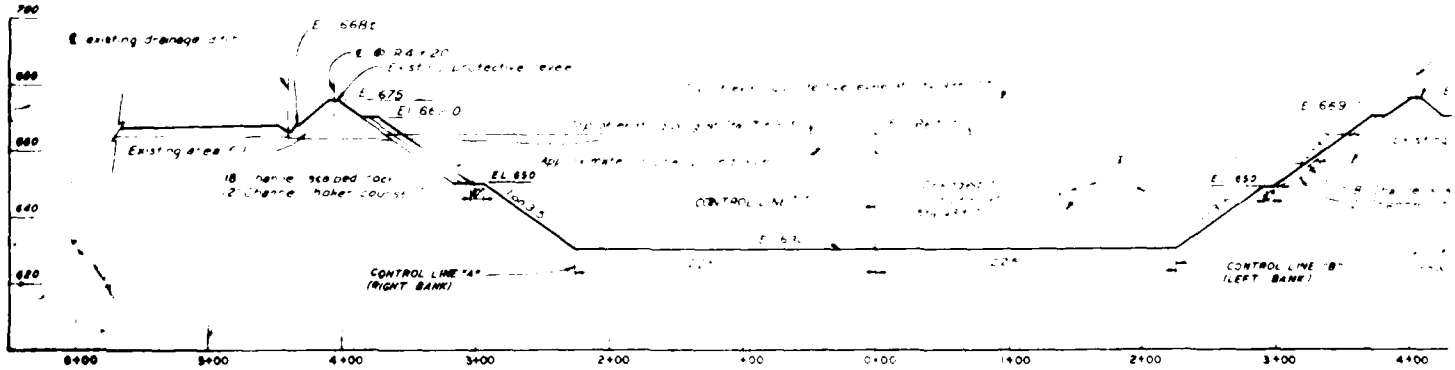
SECTION G 38|47 APPROACH CHANNEL AT STA 45+00



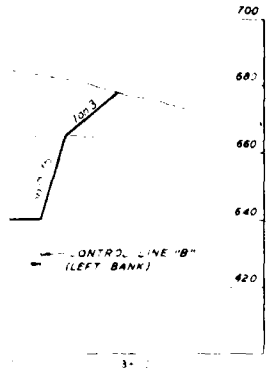
SECTION H 38|47 OUTLET CHANNEL AT STA 55+00

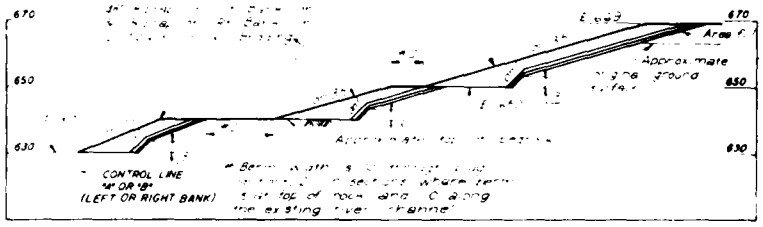


SECTION I 38|47 OUTLET CHANNEL AT STA 63+00

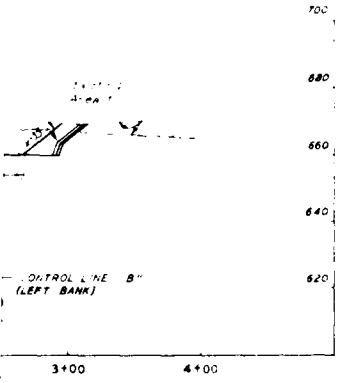


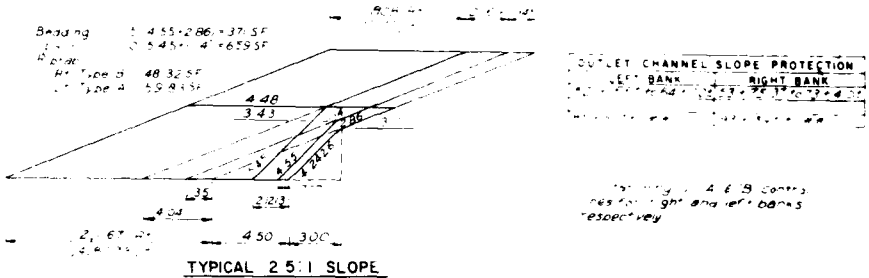
SECTION J 38|47 OUTLET CHANNEL



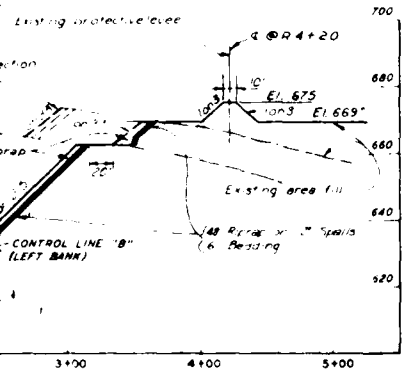


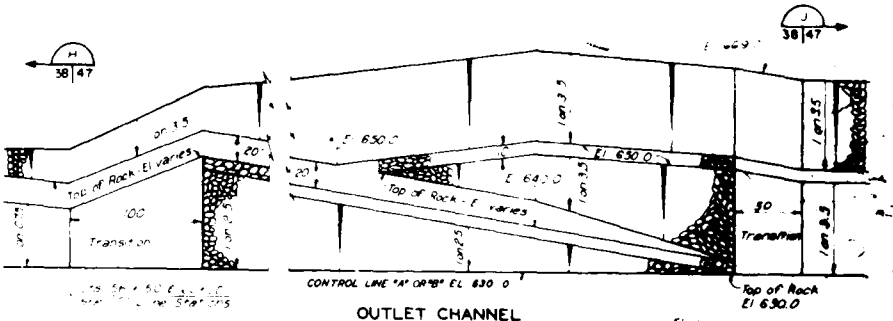
TYPICAL SECTION CHANNEL SLOPE
TRANSITION AREA



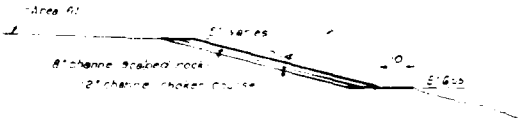


TYPICAL 2.5:1 SLOPE

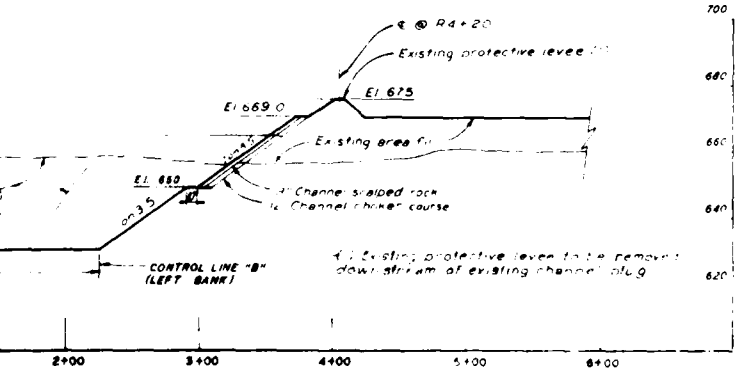




OUTLET CHANNEL
PLAN FOR TRANSITIONS
Not to Scale



RIVER CHANNEL SLOPE PROTECTION



DRAWINGS IN THIS FOLIO
HAVE BEEN REDUCED TO ONE
HALF THE ORIGINAL SCALE

Revisions Descriptions	Symbol	Date	Approved

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

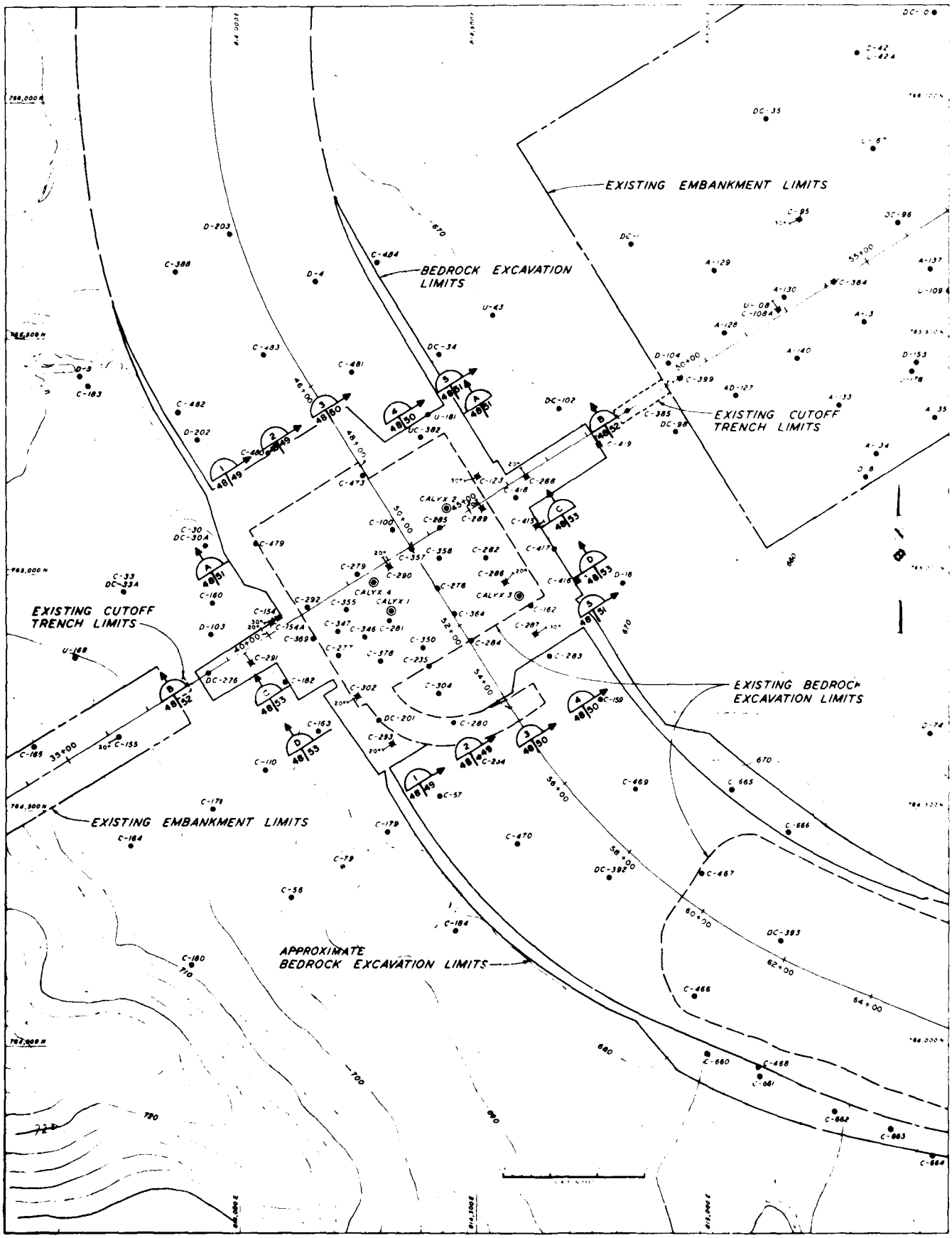
US Army Corps of Engineers

CONSTRUCTION FOUNDATION REPORT

APPROACH AND OUTLET CHANNELS
EXCAVATION SECTIONS

Designed by
Drawn by
Checked by
Submitted by
Scale
Date MARCH 1985
Dwg No
Sheet number
File No 0-12-9177

PLATE NO 47



PLAN OF BORINGS - SPILLWAY & POWERHOUSE

NOTE: FOR LEG

PLATE NUMBE
SECTION

NOTE: FOR LEGEND OF BORINGS SEE PLATE 4.

PLATE NUMBER WHERE SECTION IS CUT — SECTION LETTER (A) — PLATE NUMBER WHERE SECTION IS DRAWN

SECTION IDENTIFICATION

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Revisions			
Symbol	Descriptions	Date	Approved

U. S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

Designed by

Drawn by

Checked by

Submitted by

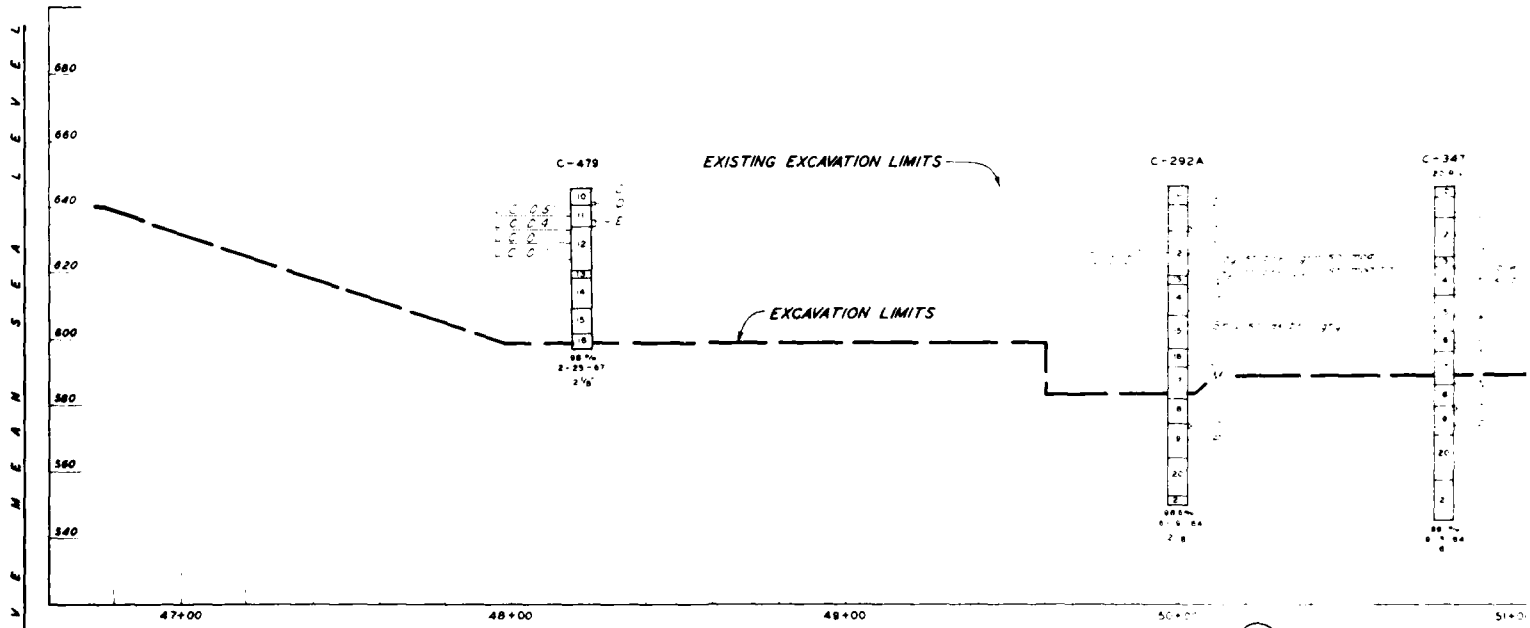
US Army Corps of Engineers

[illegible], MISSOURI
[illegible] RESERVOIR
CONSTRUCTION FOUNDATION REPORT

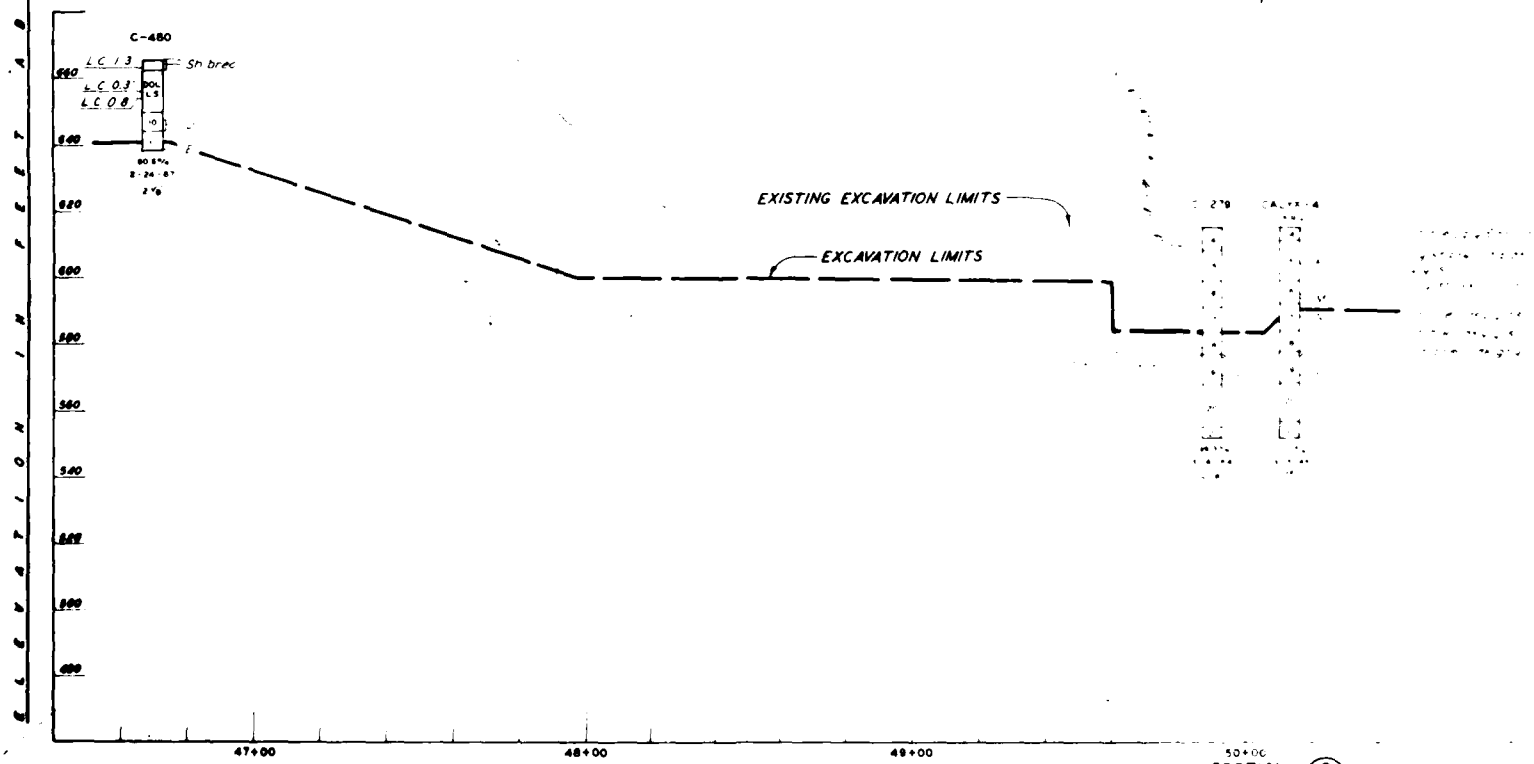
PLANS OF EXPLORATIONS
SPILLWAY POWERHOUSE

Scale: AS SHOWN
Date: MARCH 1985
Dwg No:
Sheet number:
F.W. No: 0-12-9178

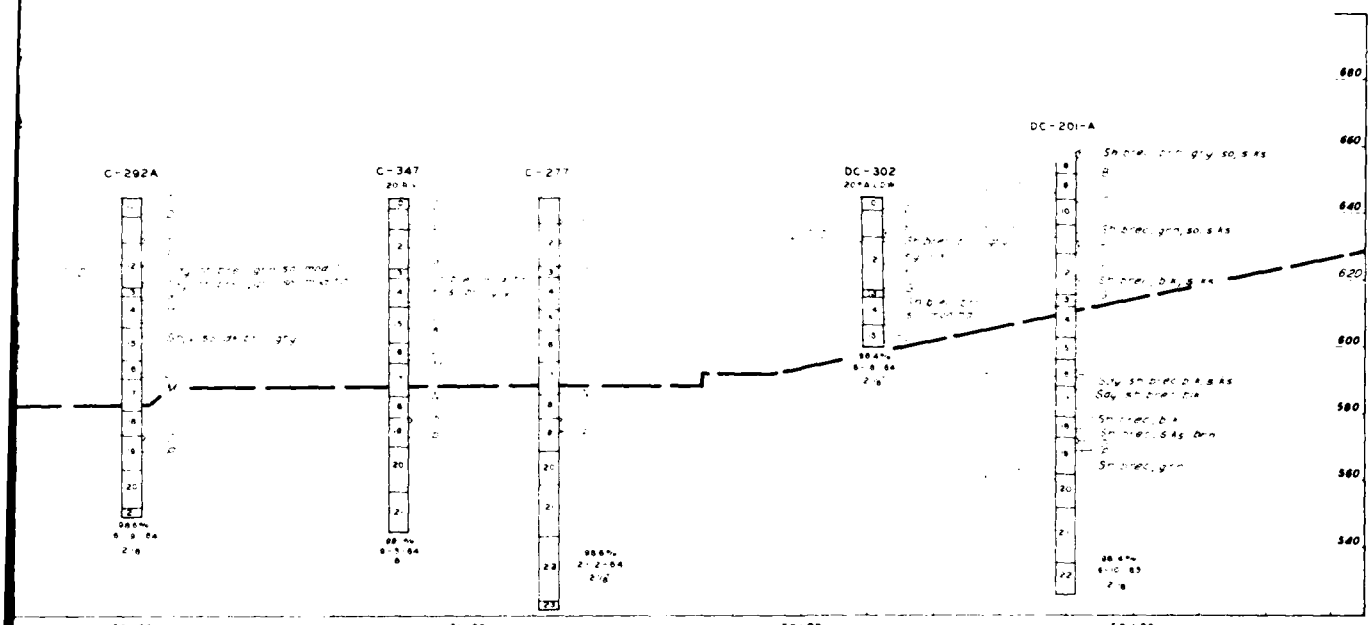
PLATE NO. 48



SECTION 1 / 48 | 49



SECTION 2 / 48 | 49



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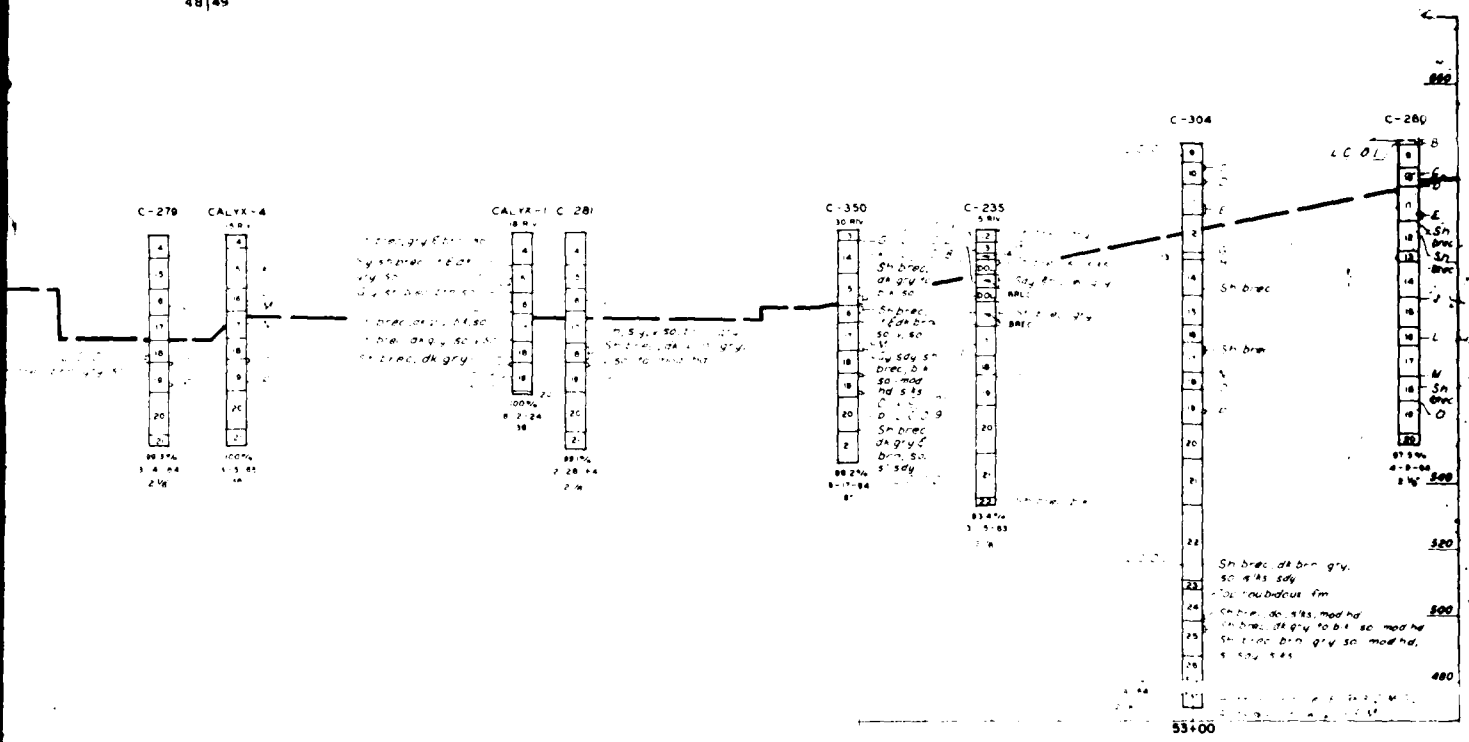

SECTION 2 (48 | 49)

See Plate 4.

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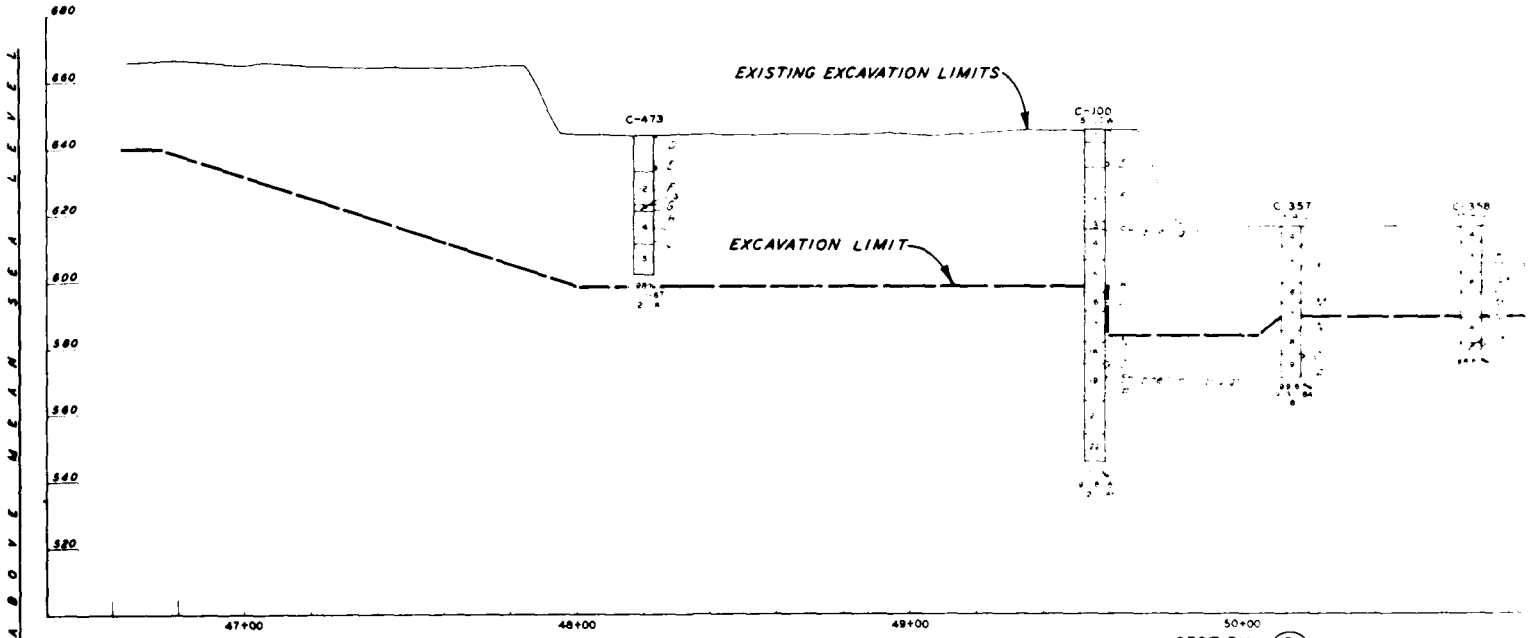
HARRY S. TRUMAN DAM AND RESERVOIR
CONSTRUCTION FOUNDATION REPORT

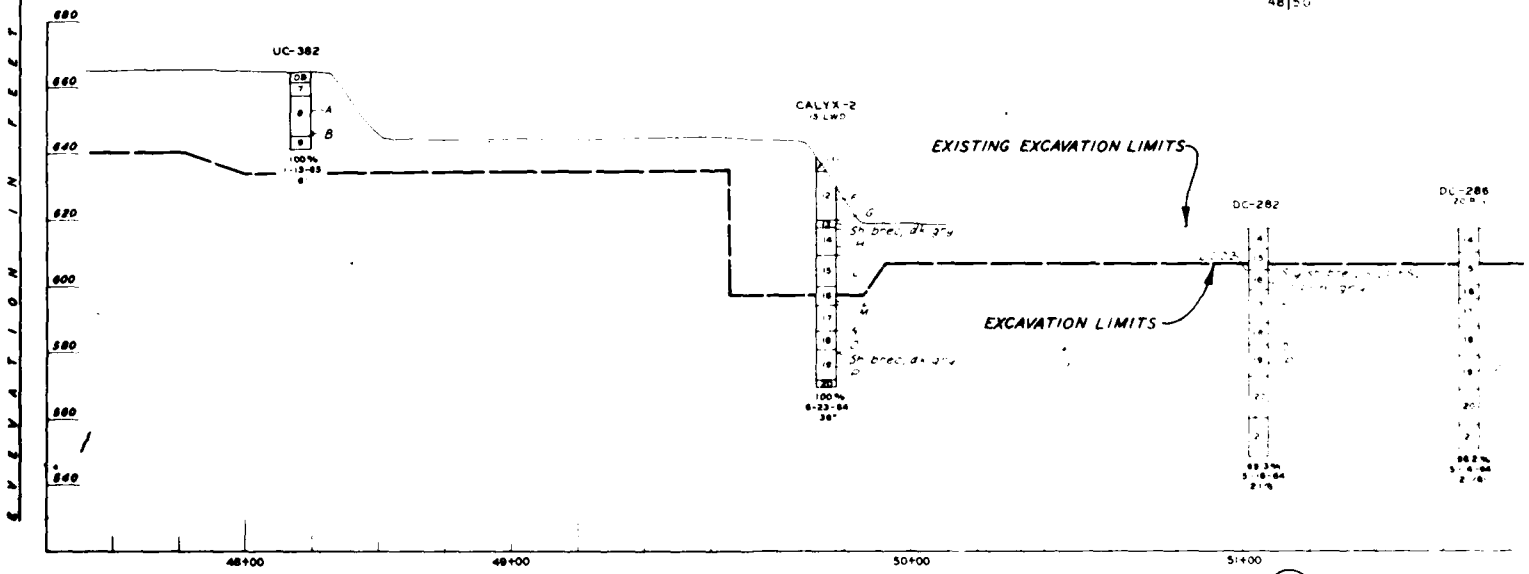
LOGS OF EXPLORATIONS
SPILLWAY - POWERHOUSE SECTIONS

Scale 1" = 5' H, 1" = 5' V
Date MARCH 1985
Dwg No
Sheet number
File No 0-12-9179

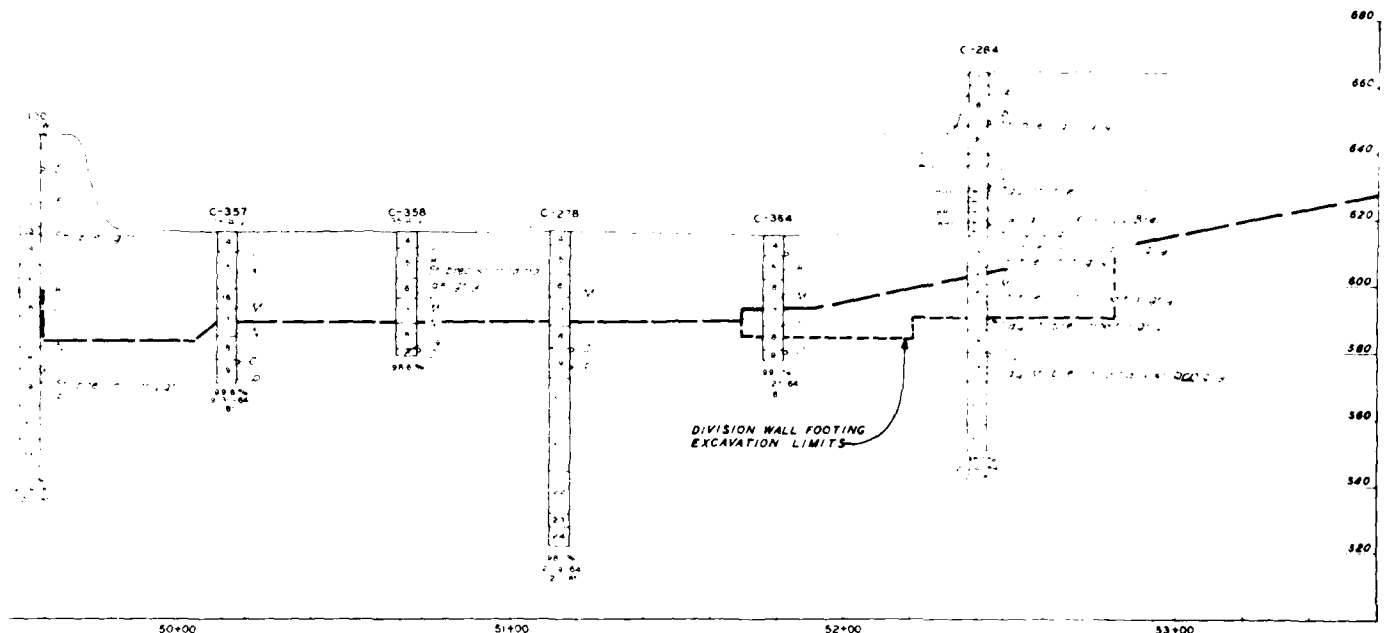
PLATE NO. 49



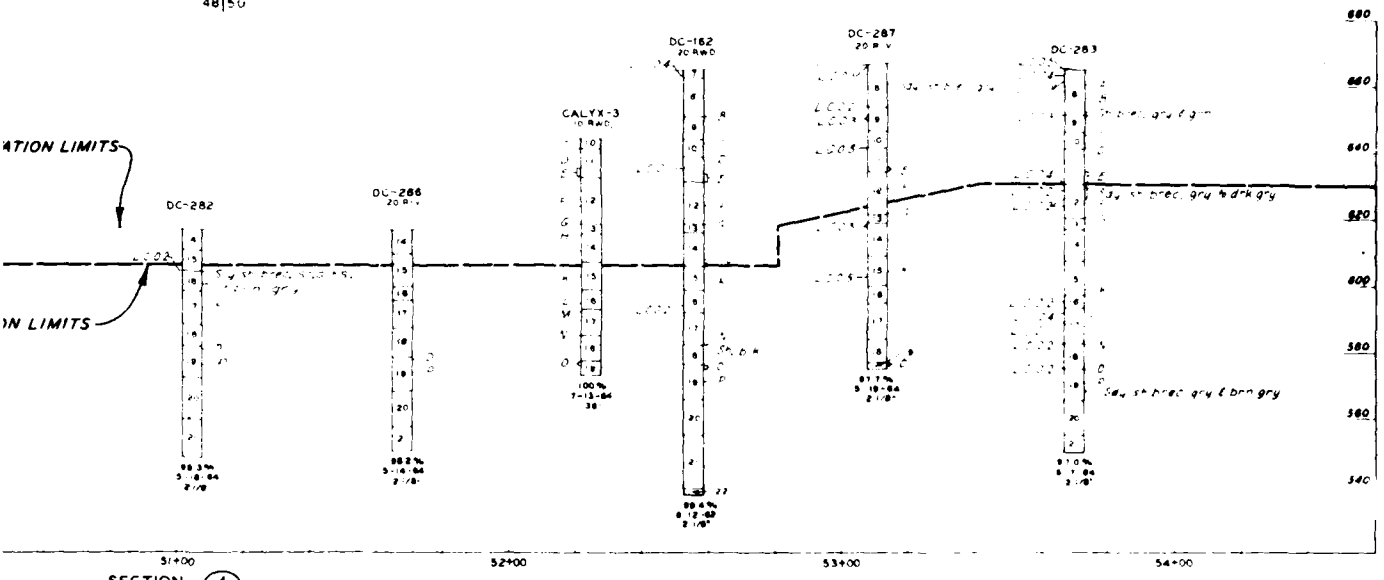
SECTION 3 / 48|50



SECTION 4 / 48|50



SECTION 3
48 | 50



SECTION 4
48 | 50

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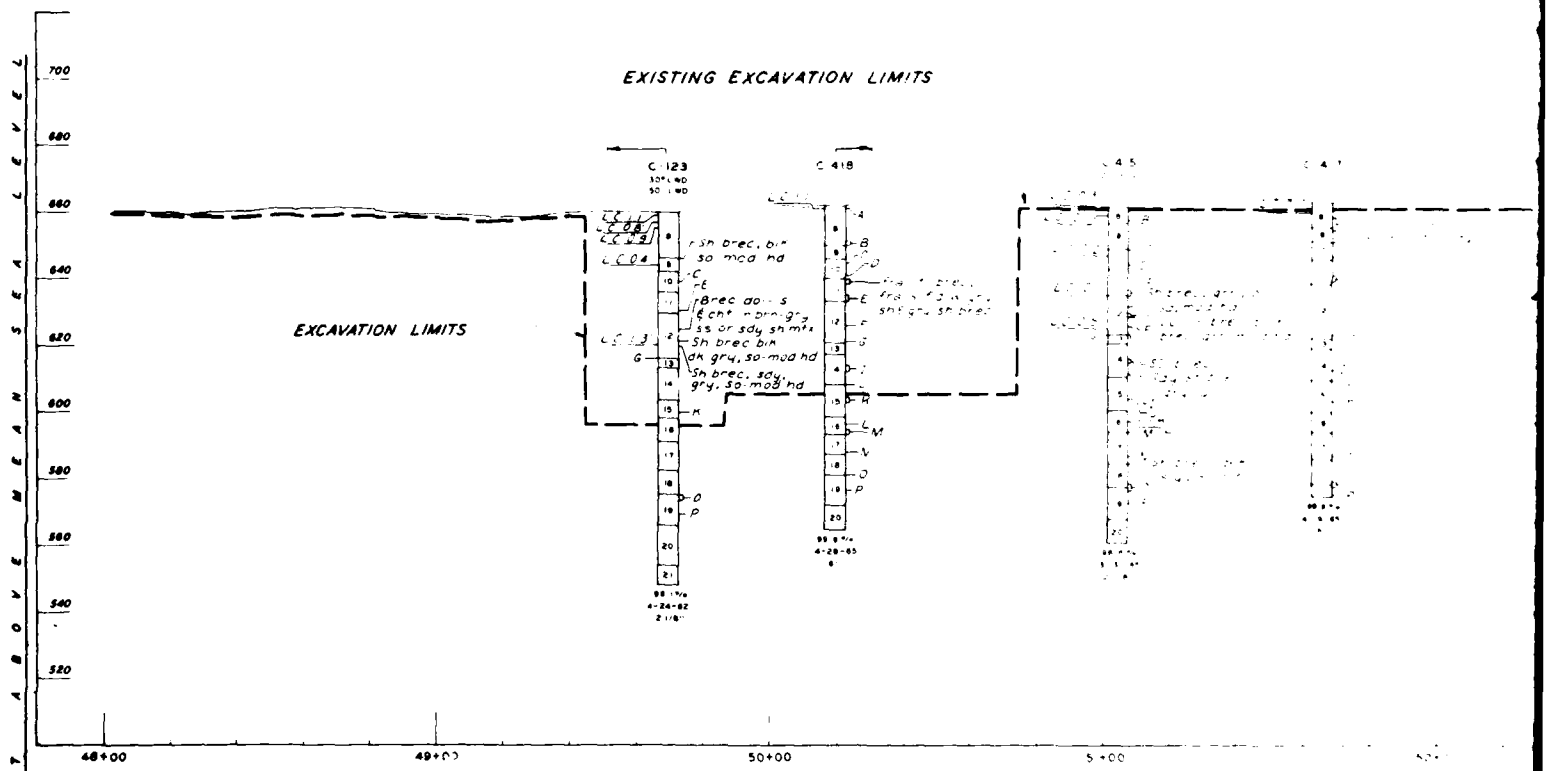
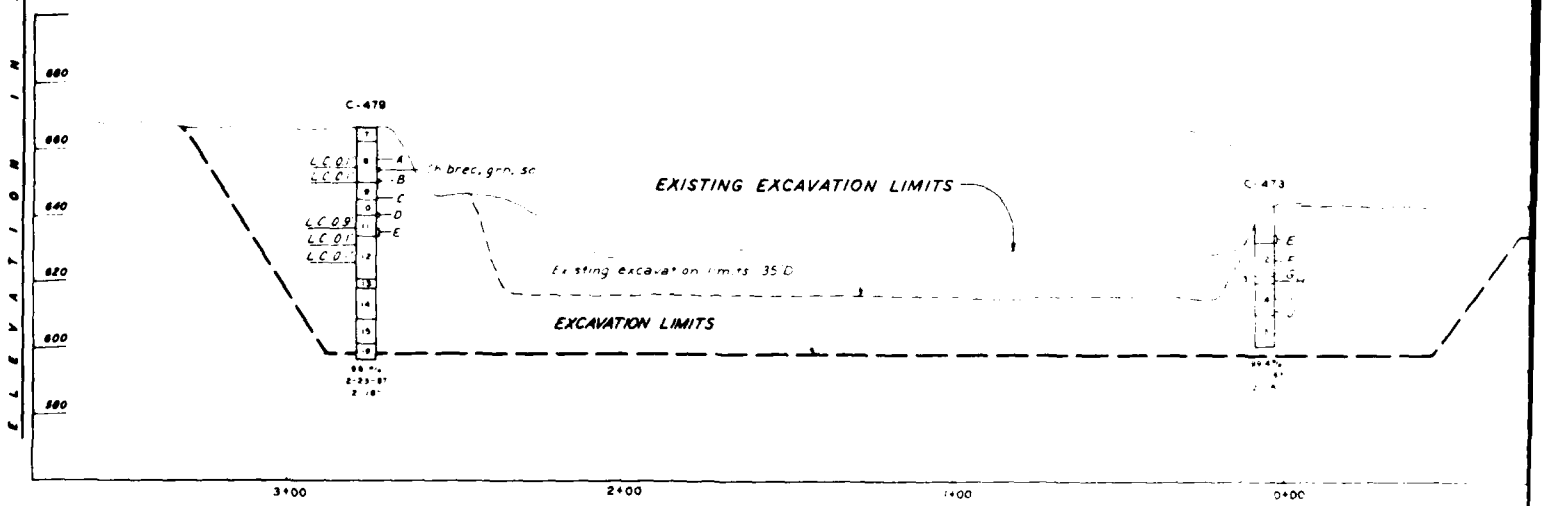
LOGS OF EXPLORATIONS
SPILLWAY - POWERHOUSE SECTIONS

Scale AS SHOWN
Date MARCH 1985
Dwg No.
Sheet number
File No. 0-12-9180

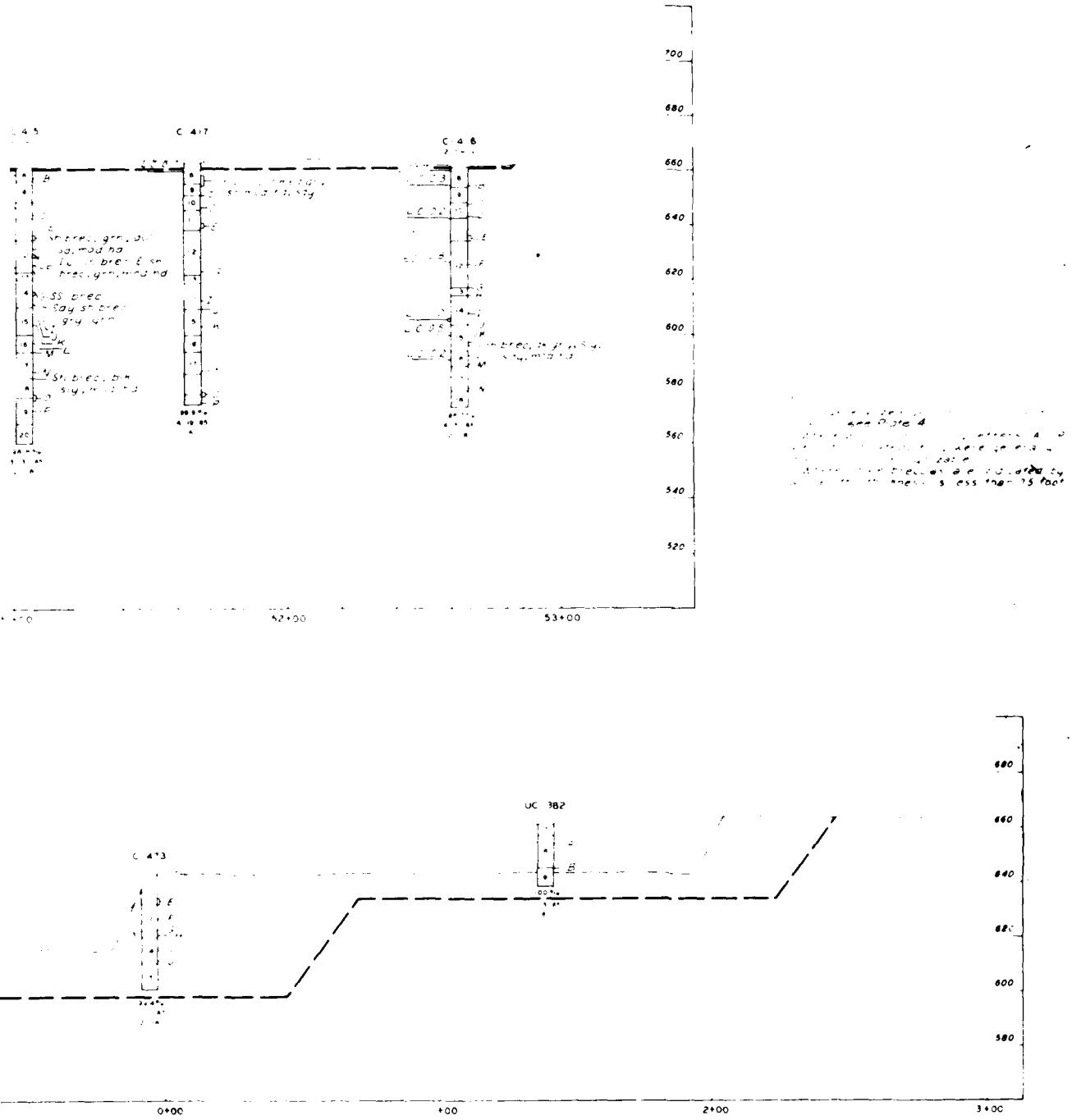
PLATE NO 50



SECTION 5 / 48 51



PROFILE A / 48 51



PROFILE A
48 | 51

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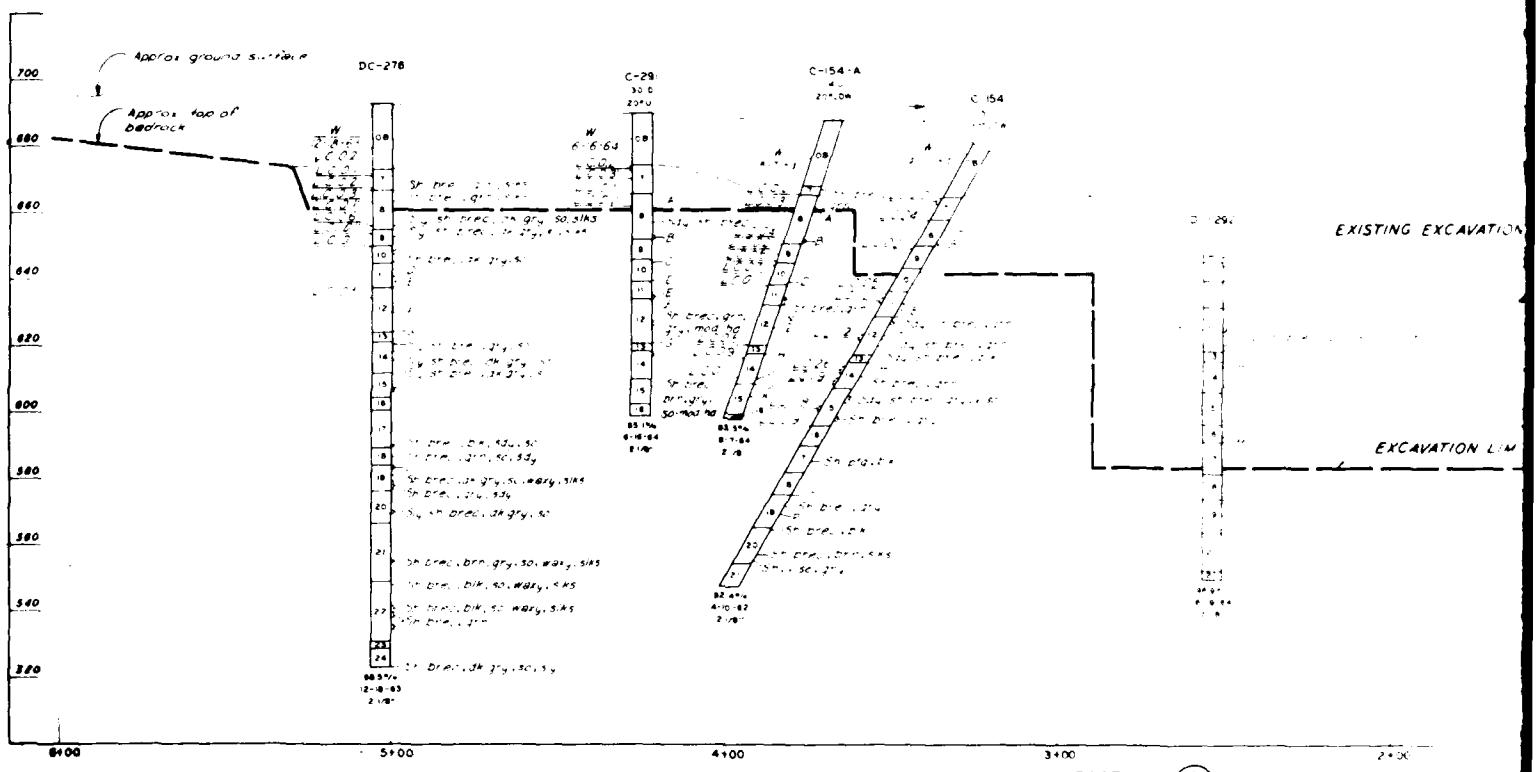
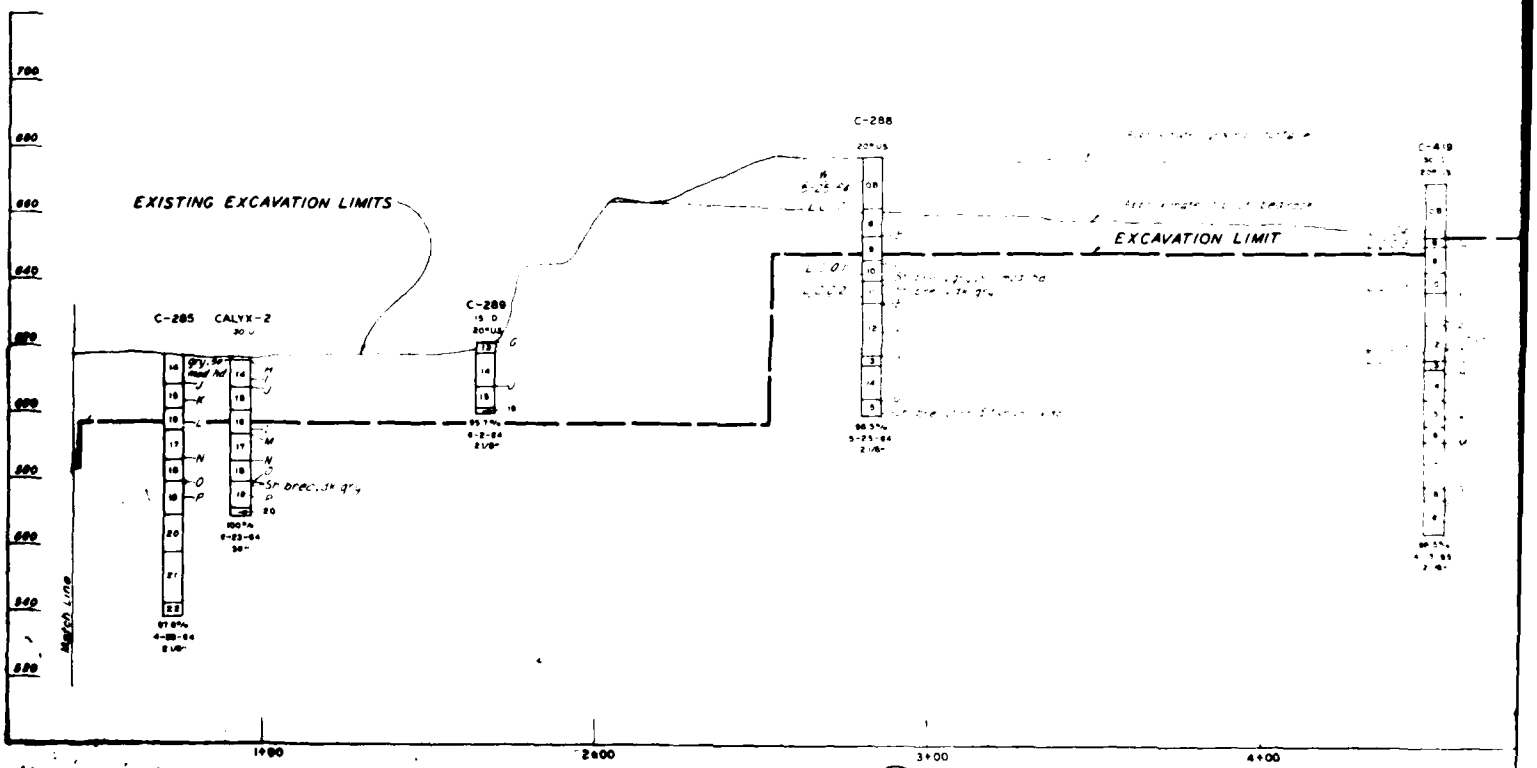
LOGS OF EXPLORATIONS
SPILLWAY POWERHOUSE
SECTION AND PROFILE

Scale
Date MARCH 1985
Drwg No.
Sheet number
File No. 0-12-9181

PLATE NO. 51



PROFILE B 48|52



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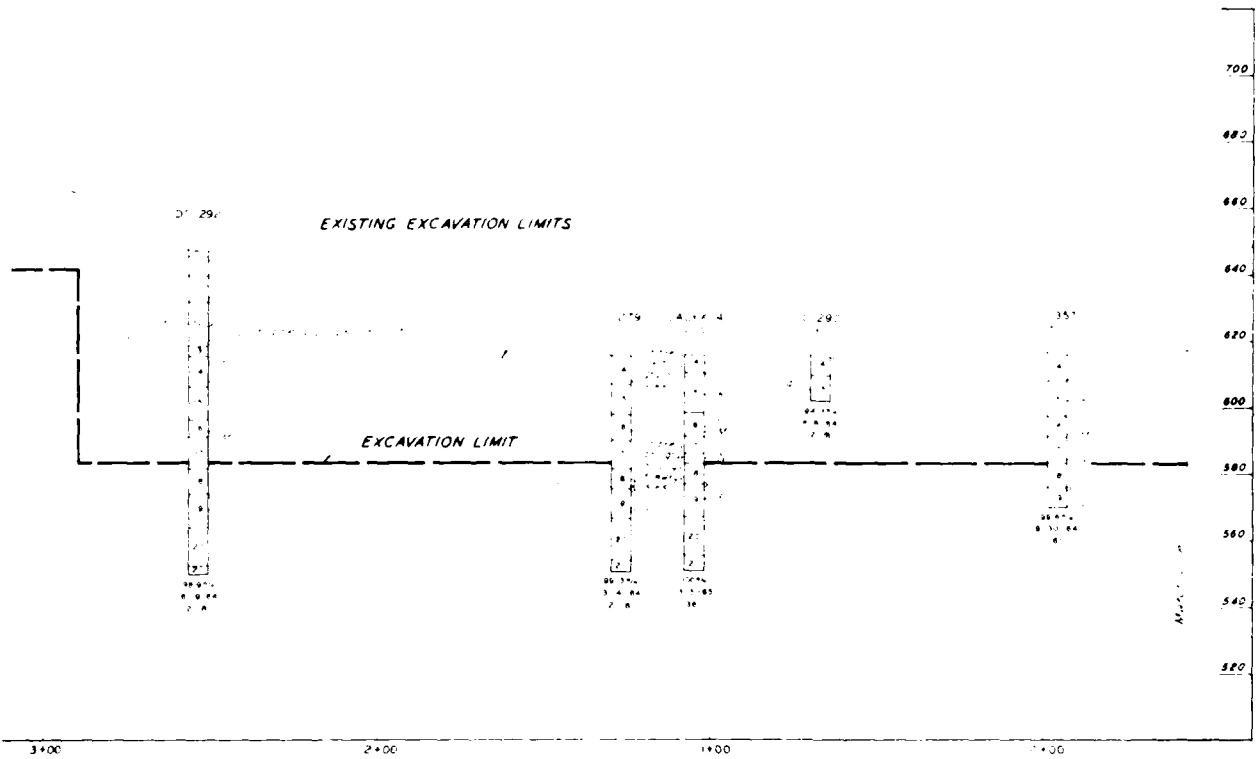
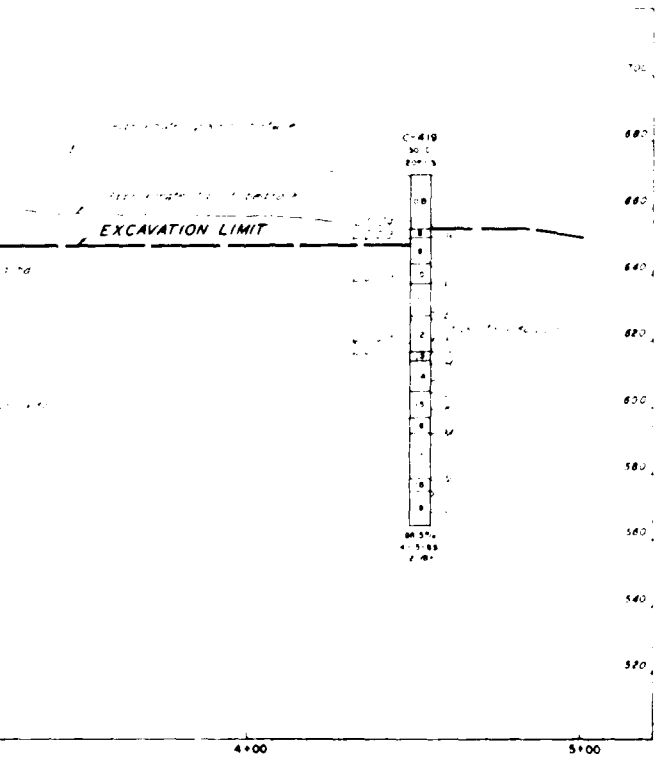


PROFILE B
48 52



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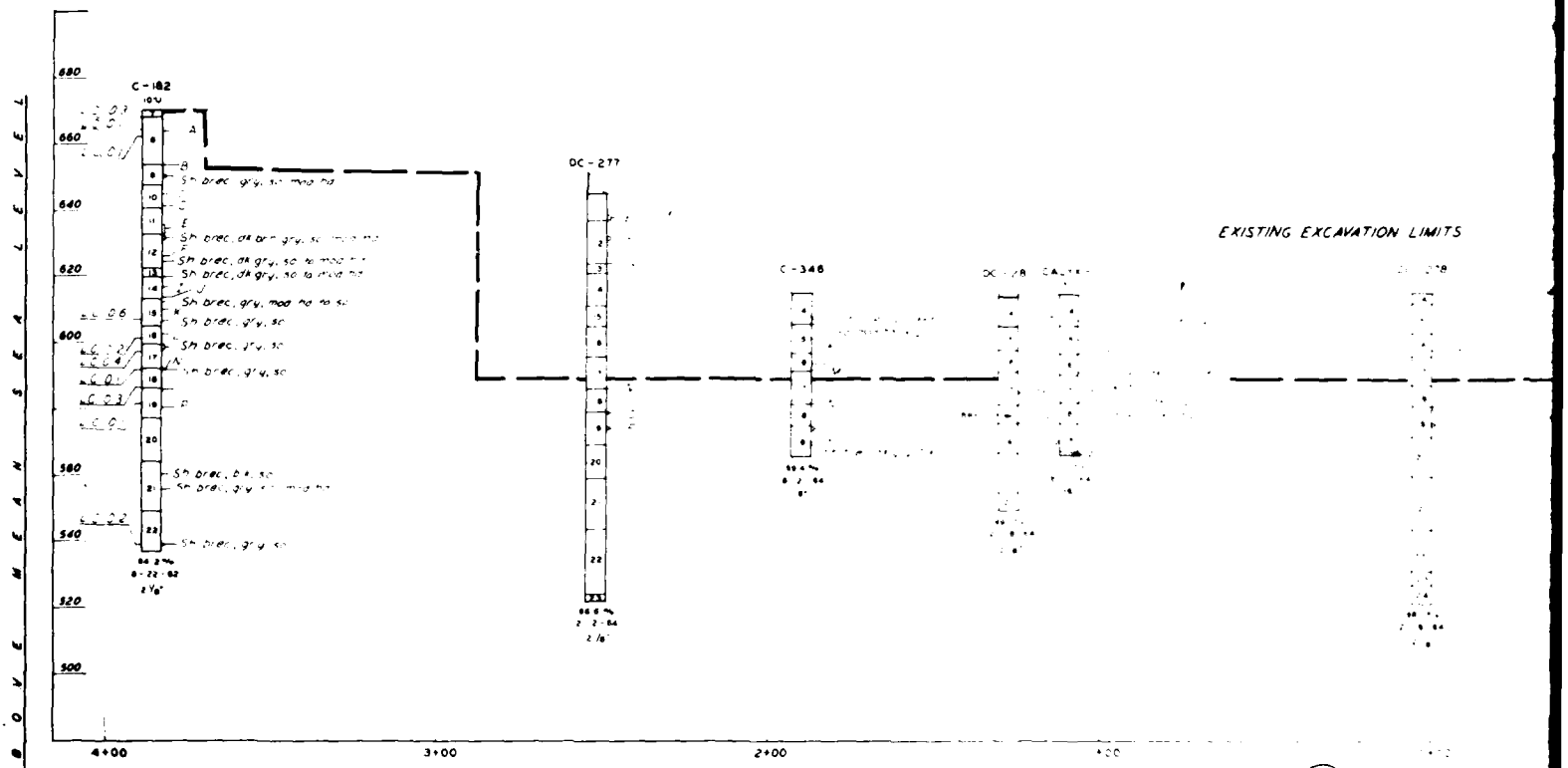
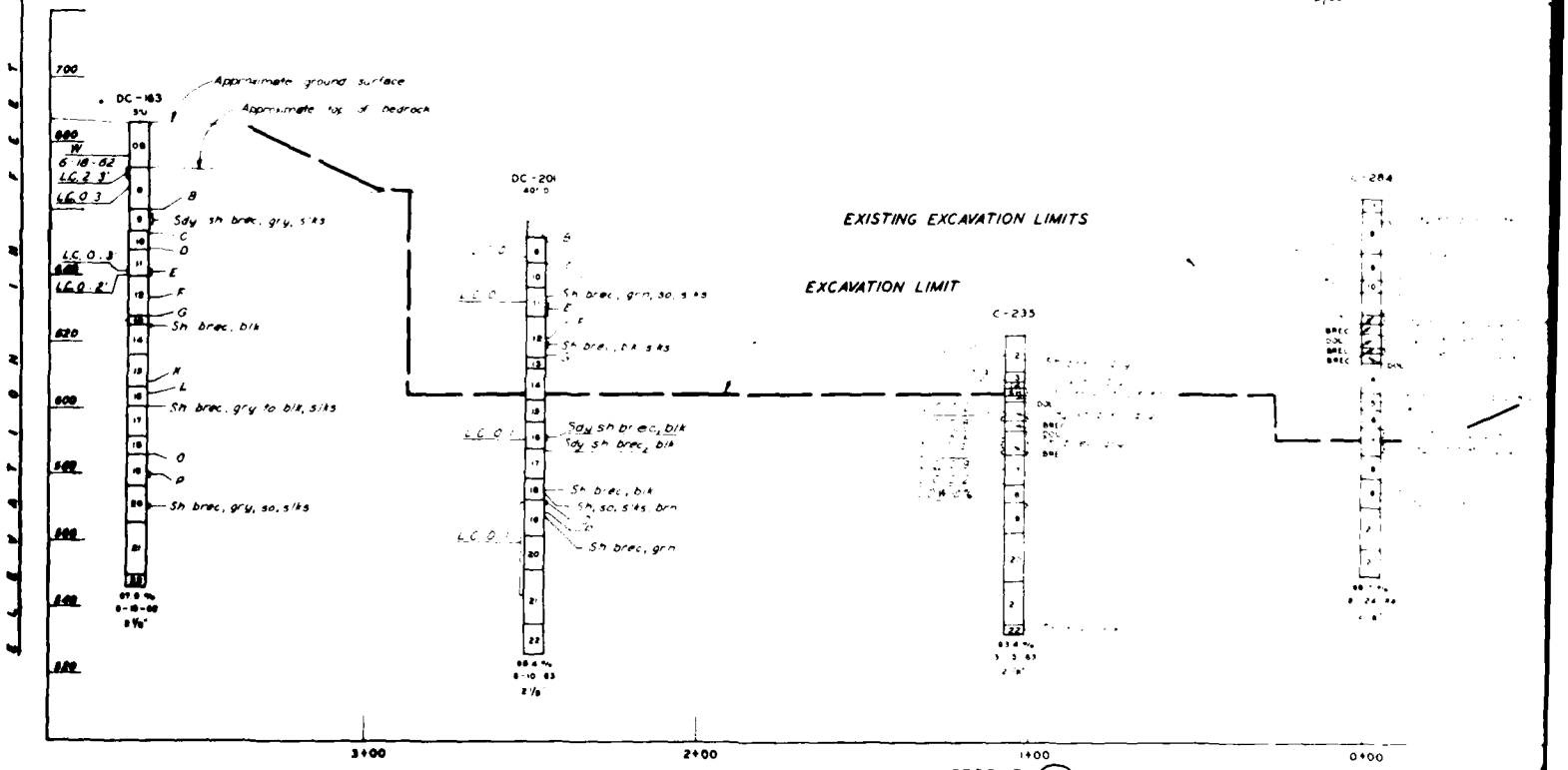
CONSTRUCTION FOUNDATION REPORT

LOGS OF EXPLORATIONS
SPILLWAY - POWERHOUSE PROFILE

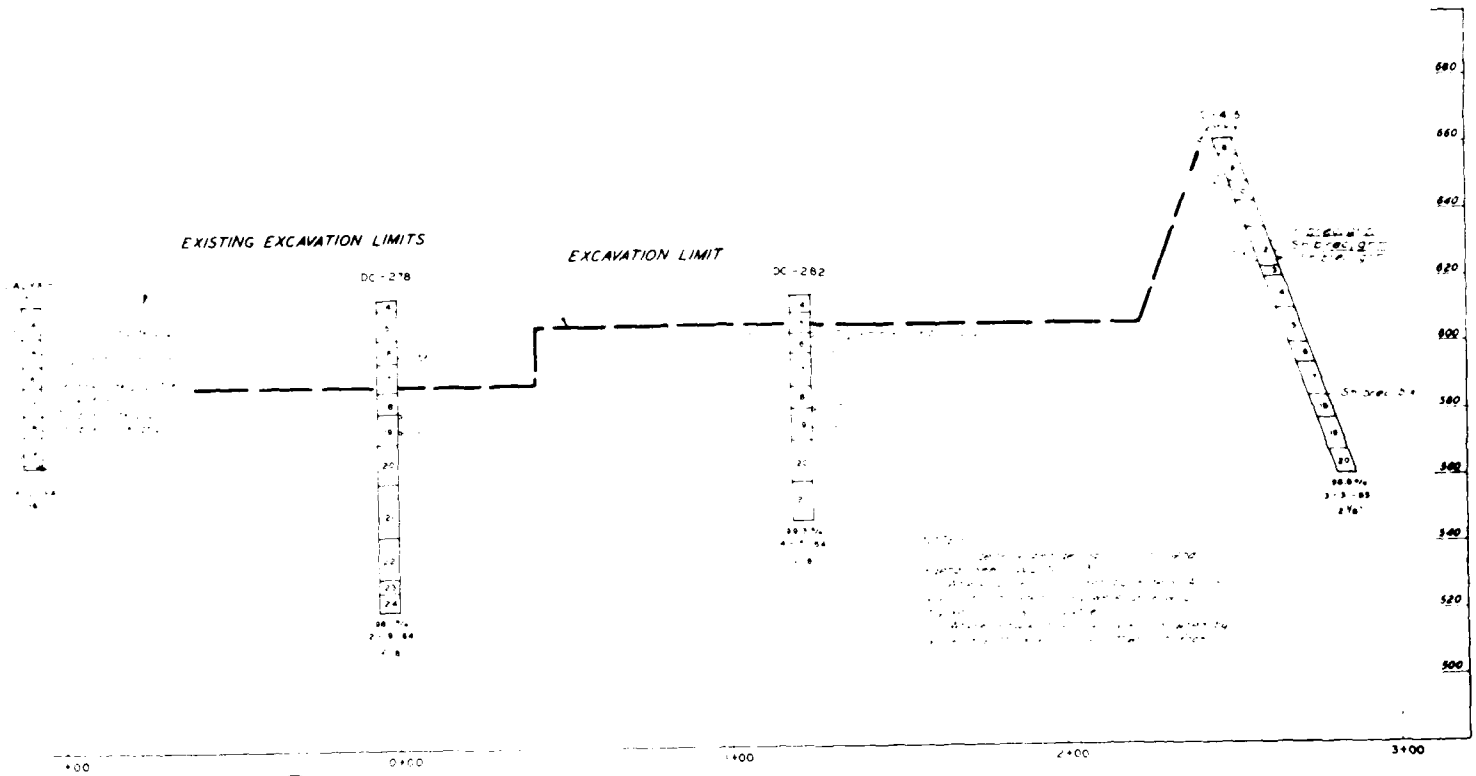
Scale
Date MARCH 1985
Drawn
Sheet number
No. 0-12-9182



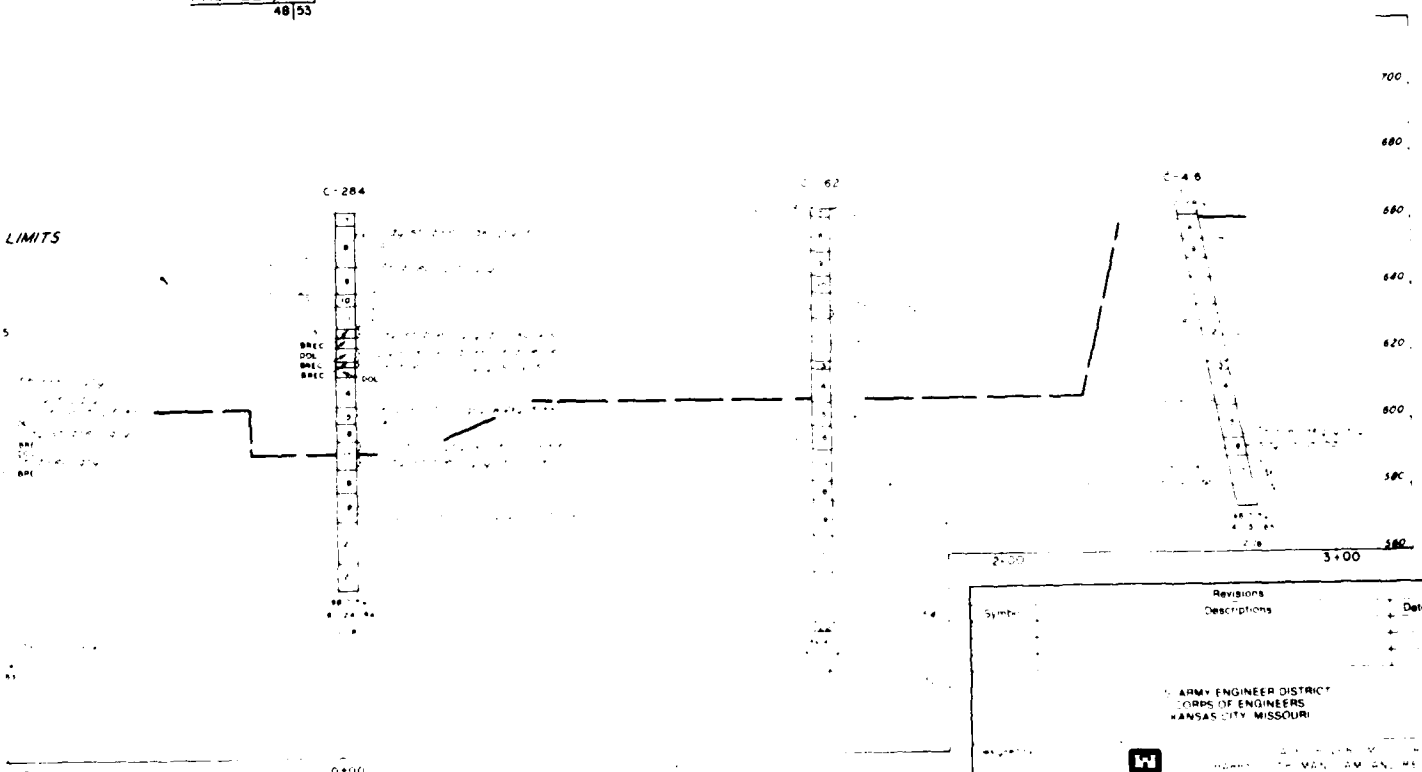
PROFILE C
48/53



PROFILE D
48/53



PROFILE C
48|53



D
48|53

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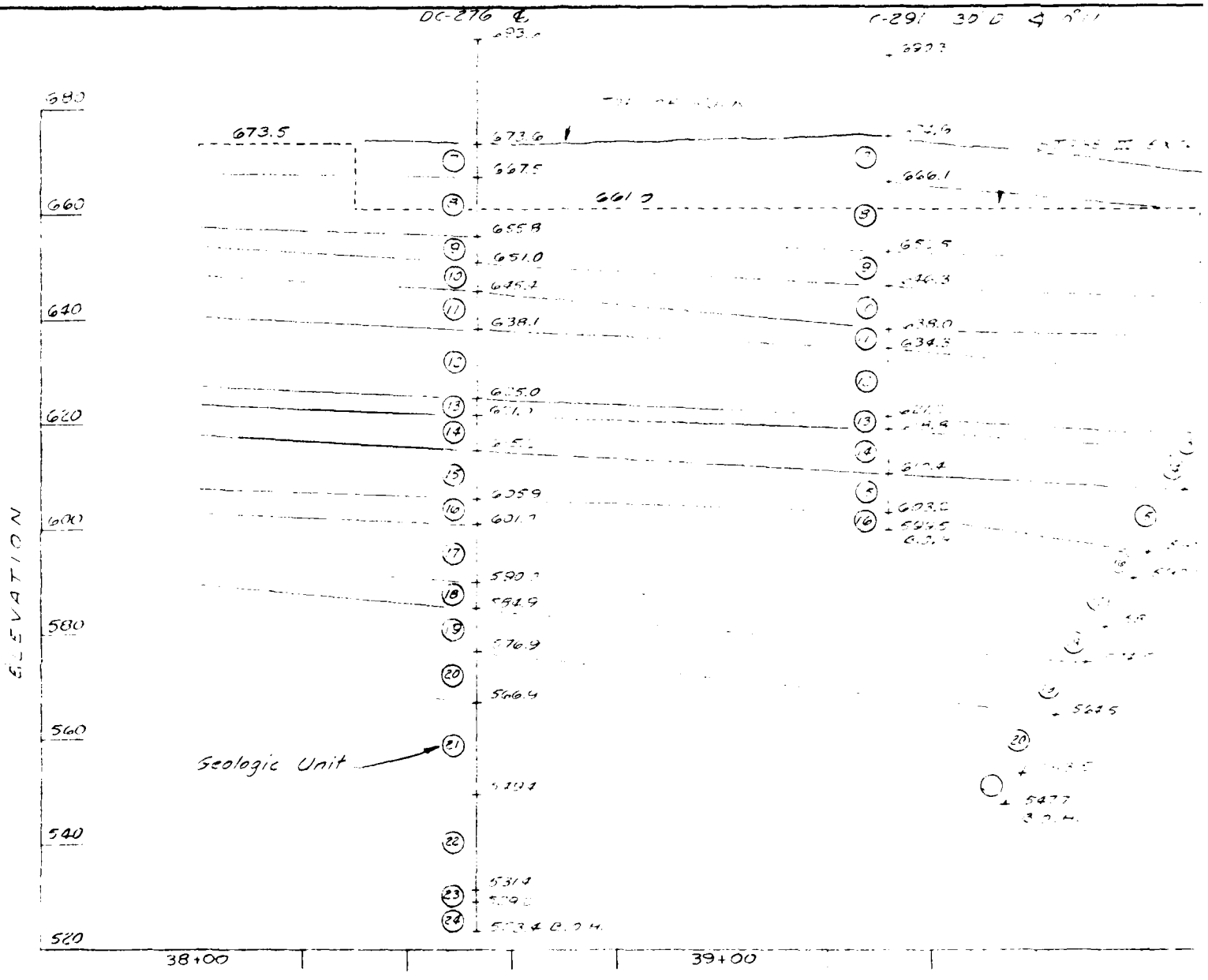
CONSTRUCTION FOUNDATION REPORT

LOGS OF EXPLORATIONS
SPILLWAY - POWERHOUSE PROFILES

Scale
Date MARCH 1985
Sheet number
Drawing No. 0-12-9183

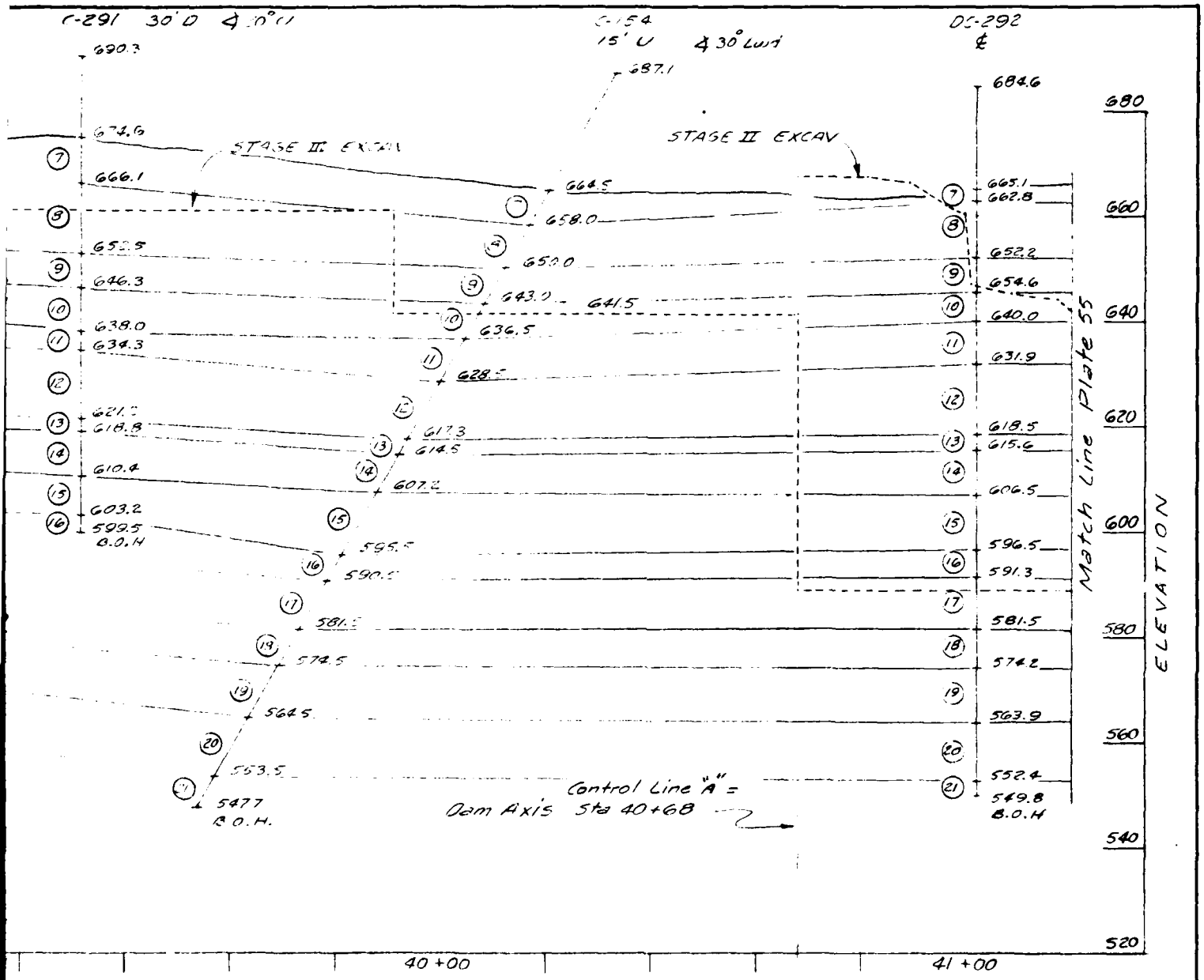
PLATE NO 53



LIMITS OF ROCK EXCAVATION - SADDLE AREA
LOOKING UPSTREAM

For Legend See Plate 4

SCALE IN FEET



TION - PROFILE ALONG DAM AXIS
OOKING UPSTREAM

0 20
SCALE IN FEET

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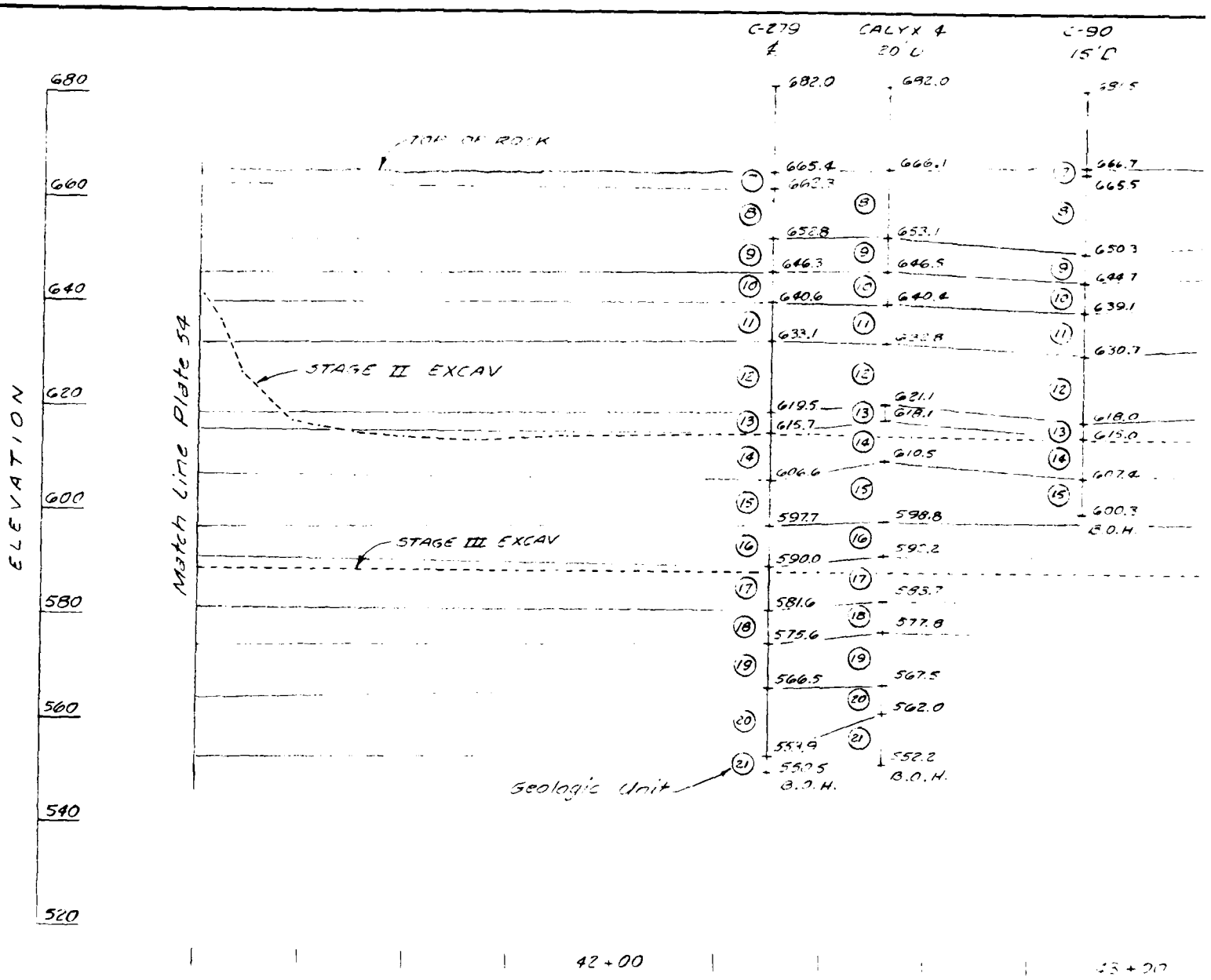
LIMITS OF ROCK EXCAVATION
PROFILE ALONG DAM AXIS

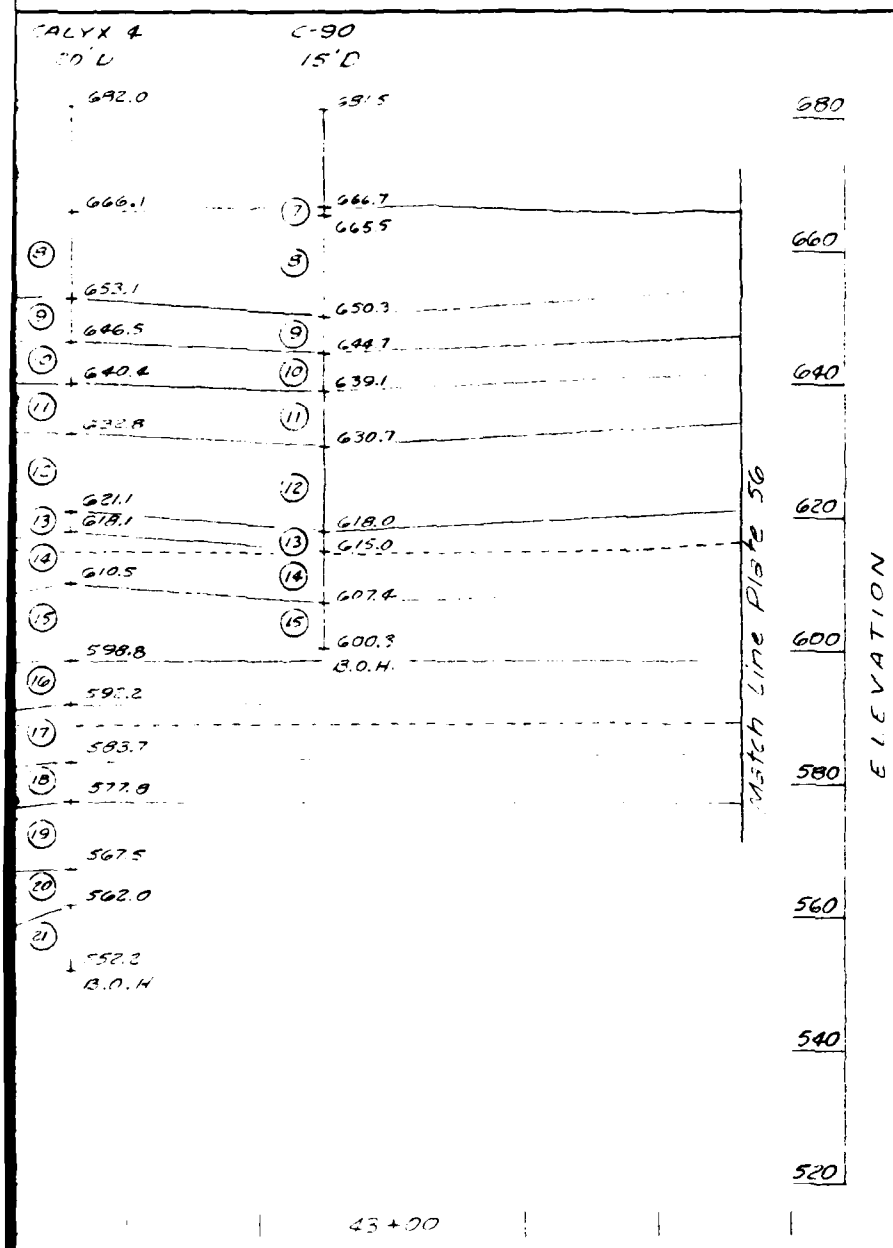
Scale: AS SHOWN
Date: MARCH 1966
Sheet number: –
Dwg No. 0-12-9184



LIMITS OF ROCK EXCAVATION - PROFILE ALONG DAM AXIS
LOOKING UPSTREAM

For Legend See Plate 4

0 20
SCALE IN FEET



E ALONG DAM AXIS

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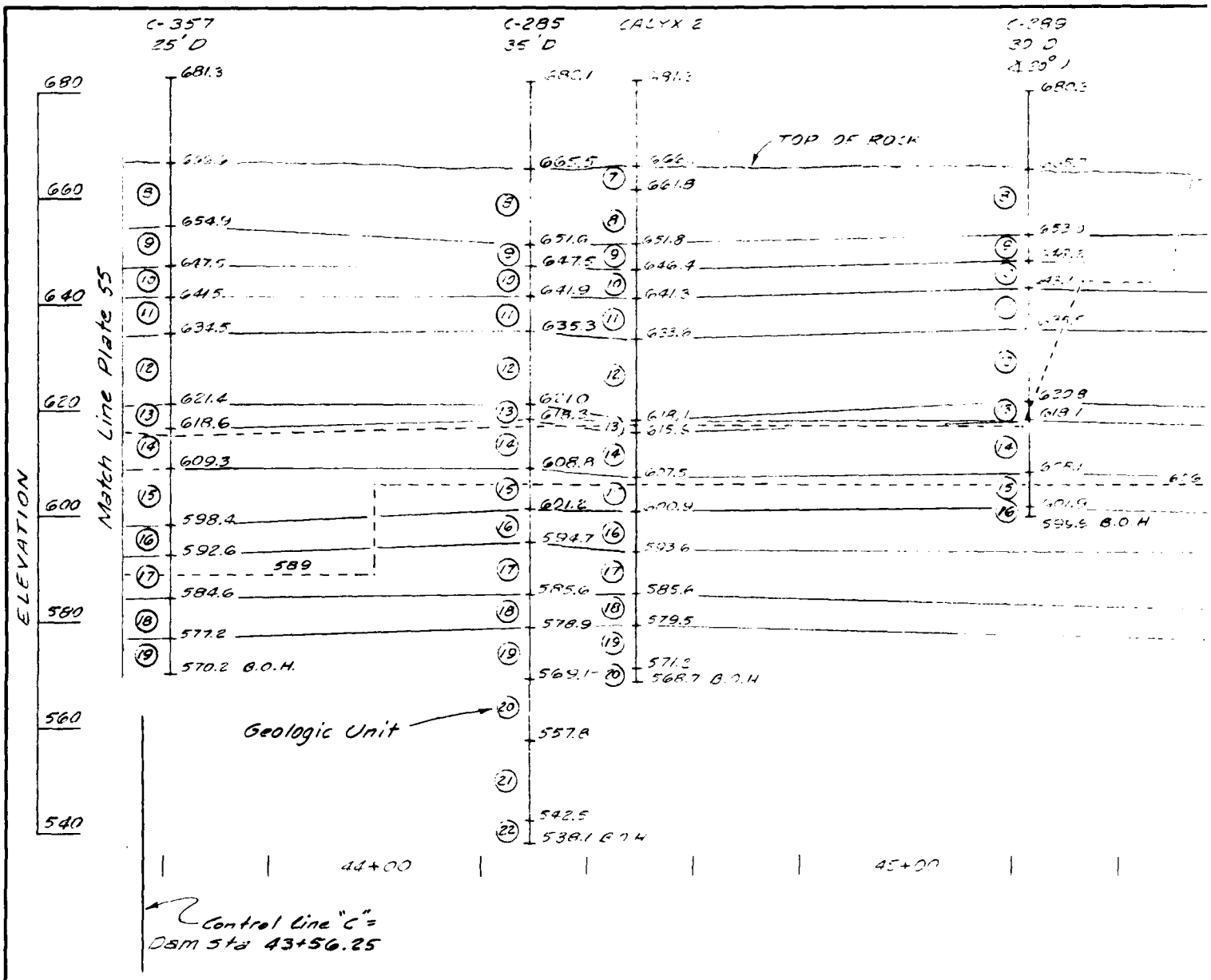
LIMITS OF ROCK EXCAVATION PROFILE ALONG DAM AXIS

Scale: AS SHOWN
Date: MARCH 1985
Sheet number:
Drawing No.: 0-12-9885

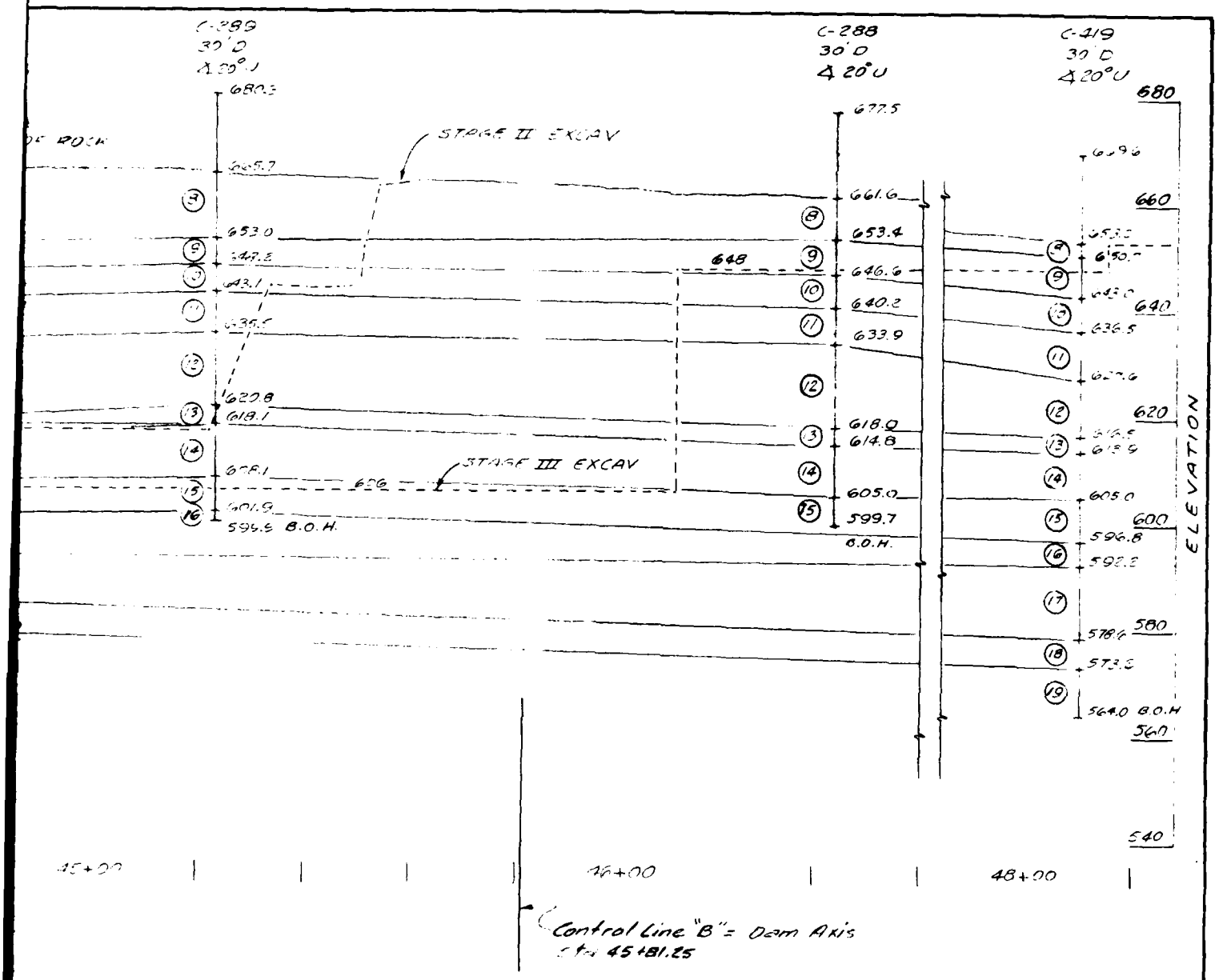
PLATE NO. 55



LIMITS OF ROCK EXCAVATION - PROFILE
LOOKING UPSTREAM

For Legend See Plate 4

0 20
SCALE IN FEET



EXCAVATION - PROFILE ALONG DAM AXIS
LOOKING UPSTREAM

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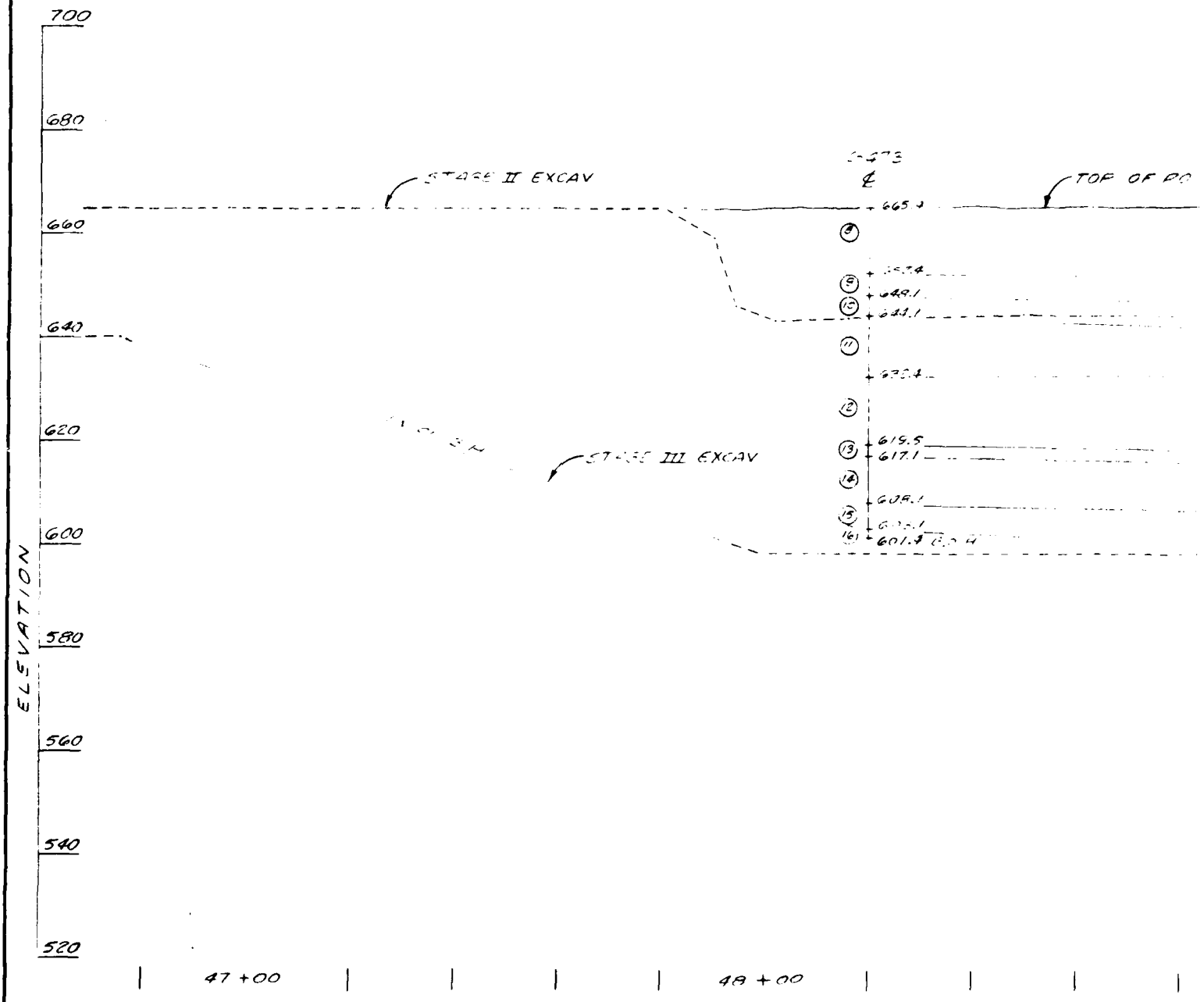
LIMITS OF ROCK EXCAVATION PROFILE ALONG DAM AXIS

Scale: AS SHOWN
Date: MARCH 1986
Sheet number:
Dwg. No.
Sta. No. 0-12-9165

PLATE NO. 56

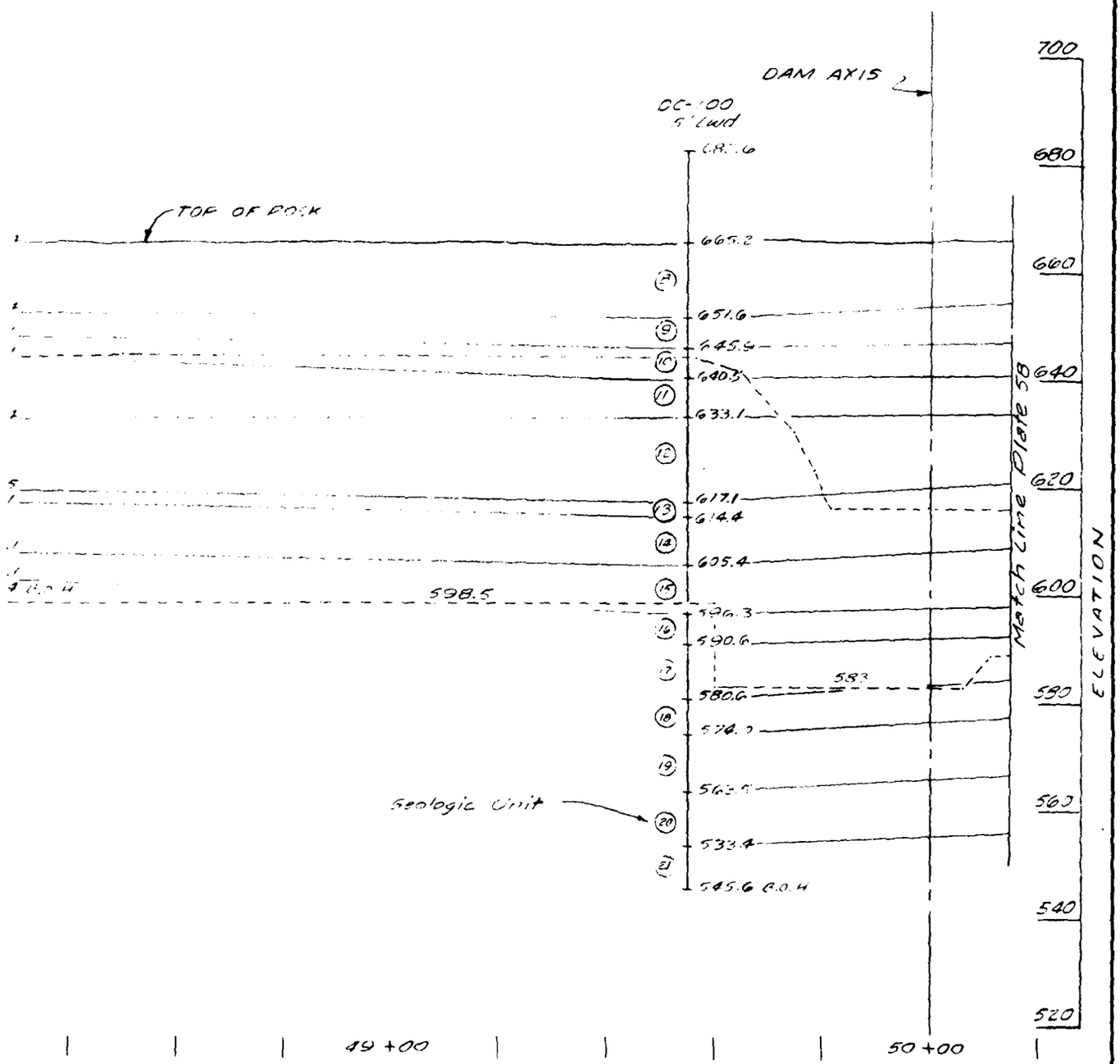


LIMITS OF ROCK EXCAVATION - PROFILE

Control Line "C" = Dam Station 43+56.25

For Legend See Plate 4

0 20
SCALE IN FEET



ON - PROFILE ALONG LINE "C"

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LIMITS OF ROCK EXCAVATION
PROFILE ALONG LINE "C"

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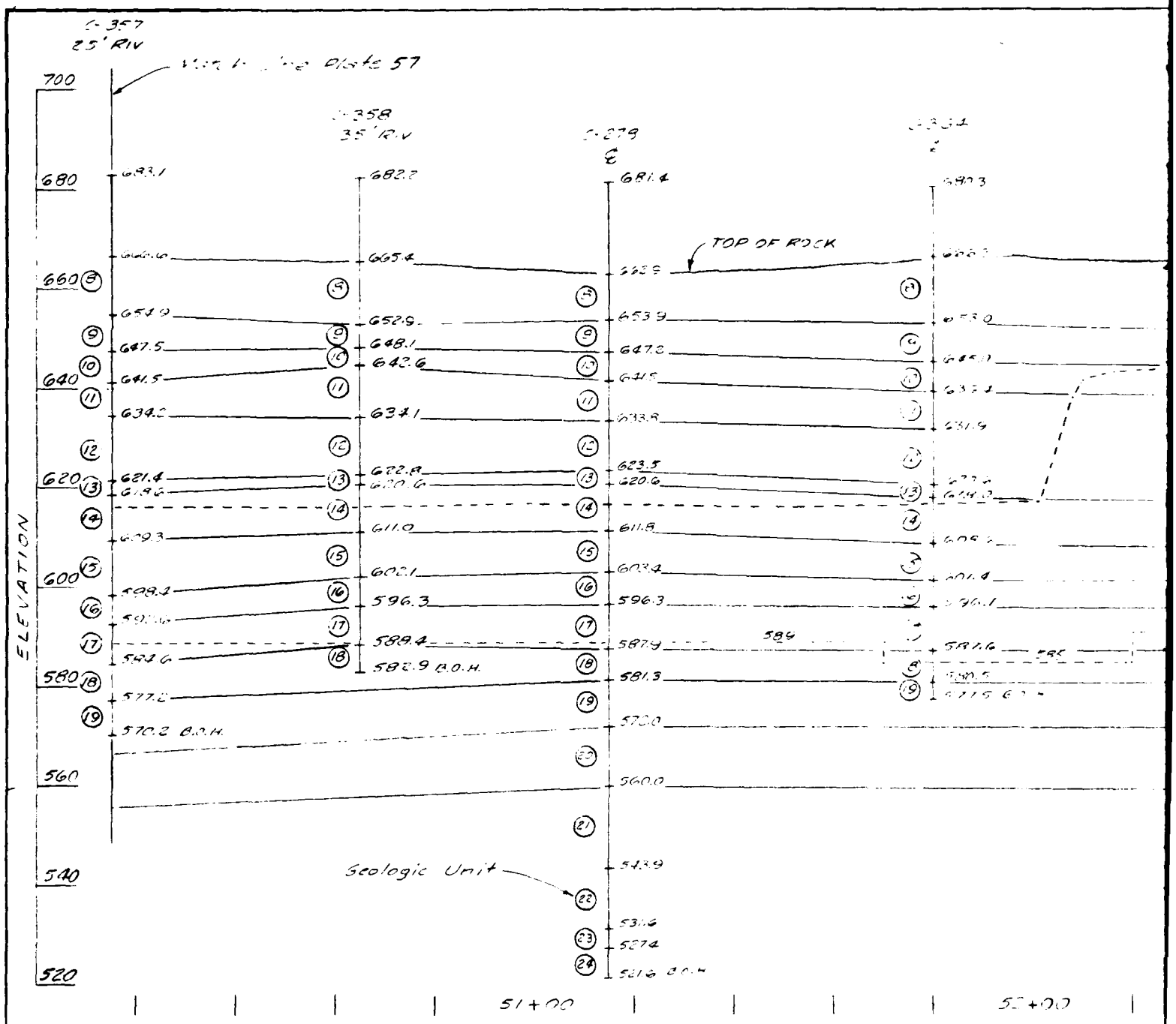
Scale: AS SHOWN
Date: MARCH 1988
File No. 0-12-9187

0 20
SCALE IN FEET

57

PLATE NO. 57

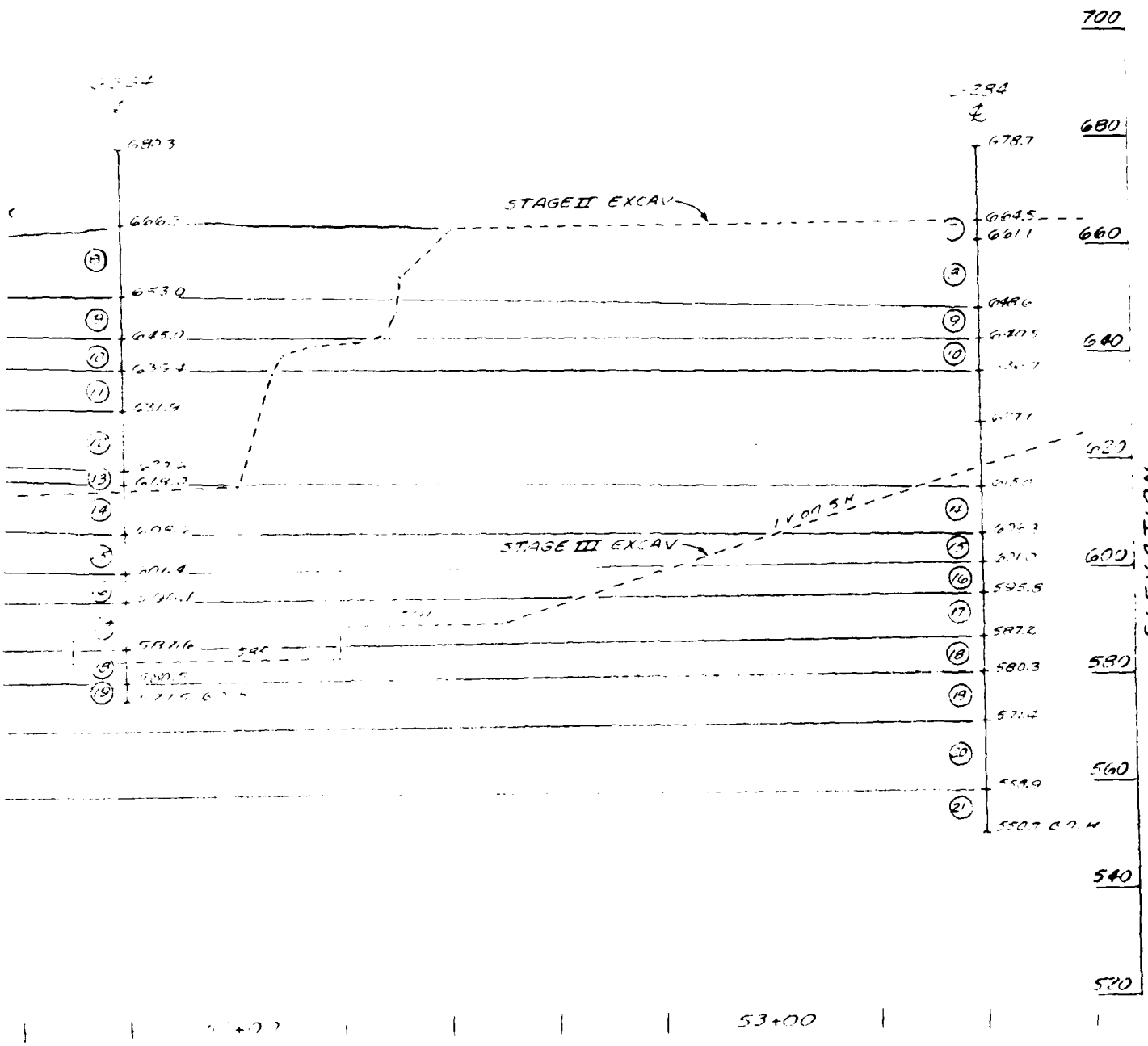


LIMITS OF ROCK EXCAVATION - PROFILE

Control Line "℄" = Dam Station 42+56.25
Dam Axis is at Sta 50+00

For Legend see Plate 4

0 20
SCALE IN FEET



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LIMITS OF ROCK EXCAVATION
PROFILE ALONG LINE "C"

Scale

Sheet number

Date: MARCH 1966

File No. 0-12-9188

0 20
SCALE IN FEET

GEOLOGIC UNIT DESCRIPTIONS

To understand the map of the spillway powerhouse area, it may be interesting to note the method used to obtain the detail of the units, subunits, and their location. The vast exposure of the rock surfaces portrayed the big picture in viewing the units, and their trends, individually; and in relation to each other. Unit descriptions and their direction were obtained and traced along the unweathered presplit final rock surfaces. Accuracy in locating these units in respect to elevation and station was assured by the following method.

As the rock was being prepared (scaled, trimmed, and cleaned) there was opportunity to examine the rock and to map it by increments specifically pinpointed by the concrete pour layout drawings of the contract plans. As the rock was marked according to scheduled concrete pours, the foundation was also mapped. Essentially steel rebars, a part of the reinforced concrete design, were generally situated near the exposed rock surface on 12-inch centres to form a mat. The mat served as a grid over the rock providing control in which to map. Generally, stations, ranges, and elevations were a part of the pour layouts providing sufficient survey accuracy to map without the use of a survey party. Hence, no survey party was used. Finally, the "big picture" was thereby reproduced showing each rock unit, subunit, and boundary merely by fitting the rock map of each concrete pour together after concreting was completed.

GEOLOGIC UNIT DESCRIPTIONS

Unit 8

Description of Unit 8 is from the base (lowermost elevation upward). Unit 8 appears weathered with brown stain evident throughout.

8A

0.7 - 1.3' Dolomite, shaly, lamellar to very thin bedded (up to ¼"), gray, with blue-gray and black shale along beds. Unit is undulating generally and deformed locally.

8B, 8C

± 3' Dolomite, gray, moderately hard

8C - Upper half - hackly and tripolitic.

8B - Lower half - very thin beds (1-3") locally indistinct and overridden by tripolitic dolomite, undulating, gnarly, with considerable healed high angl- fr ctures.

Top contact of ¼ - 1" b.ack chert locally indistinct.

8D, 8E

± 2' Dolomite, gray, moderately hard

8E - Upper half - massive, medium grained (macroscopic) sandy, with scattered high angle fractures (no accurate fracture frequency determinable).

8D - Lower half - Very thin bedded, (beds uniformly 1 - 2") very fine grained (argillaceous), shaly contacts along beds, lightly fractured to unfractured, undulating.

8F, 8G

3 - 4' Dolomite, gray, moderately hard

8G - Upper three-quarters - massive, tripolitic, hackly, and weathers brown.

8F - Lower one-quarter - red-brown-gray, very th' bedded (beds 4") with locally indistinct separations, ..ying massive appearance. Unit is gnarly with intense random high angle fracture system; discontinuous.

Unit 9

Unit 10

Subunit A - 1.5' ±

Subunit 1 - 2.5'±

Subunit 2 - 1.5'± (top of Unit 10)

TAGE III CONSTRUCTION
uman Dam and Reservoir, Missouri
apping - Spillway Powerhouse Area

GEOLOGIC UNIT DESCRIPTIONS

Unit 9

Dolomite, moderately hard, brown-gray, massive appearing, (bedding exemplified by discontinuous chert bands along horizons 6-12" apart in lower 2/3 of this unit. Chert is 1-2" thick along discontinuous bands, blue, black, and white, locally disturbed and/or deformed. Dolomite is fine to medium grained, lightly to unfractured. Upper 1/3 of this unit is browner, without chert, locally hackly, locally vuggy, and containing random assortment of disoriented rock fragments of other units.

Upper contact appears to be chert seam which may or may not be continuous.

Unit 10

Subunit A - Dolomite (2 distinguishing units)

1.5' ± Upper 1/2 of subunit A, Dolomite, pink-gray, moderately hard, very thin bedded (beds varying 1/2-3"). Beds marked by shale veneer. No separations along beds except locally single discontinuous chert horizon at the unit base. Badly fractured with shale veneer on fracture faces. No separation along fractures except in scattered areas. This unit contains a very fine grained texture, is strongly undulating, and possesses several shale veneer bedding surfaces developing into lamellas shale stringers.

Lower 1/2 of subunit A, Dolomite, dark gray, course grained (sandy), massive with scattered high angle healed fractures (lightly fractured). No bedding planes are apparent. A strong continuous lamellas, gray, shale seam 1/2 - 1" thick is at the contact between the upper and lower subunits.

Subunit 1 - 2.5'± Dolomite, gray, moderately hard, massive, hackly, very fine grained but not tripolitic. A discontinuous wide 4"± chert band appears at a horizon about 1-2 feet below top of unit. The chert is very hard, dark blue and white banded. A very thin continuous blue chert band underrides the upper contact ranging in thickness between 1/2 - 4". These bands locally reflect prelithification disturbance and/or distortion. Most prominent in the upper half of this unit are discontinuous horizons of dolomite, very fine grained, very thin bedded (beds 1"±), locally deformed and disturbed, and undulating.

Subunit 2 - 1.5'± (top of Unit 10) Dolomite, moderately hard, light gray, thin bedded (beds 2-6") very fine grained (argillaceous) and containing conchoidal fracture characteristic. Unit is lightly fractured to unfractured. Shale veneer on bedding planes.

Lower 1/2 reflects a shaly appearance with blue-gray shale stringers, lamellar (1/4"-1 1/2") scattered throughout. Shaly dolomite, light blue-gray, is common. Contact with upper unit indistinct except for rock texture.

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CONSTRUCTION FOUNDATION REPORT
GEOLOGIC UNIT DESCRIPTIONS
SPILLWAY
POWERHOUSE EXCAVATION

Scale
Sheet number
Date MARCH 1985
Dwg No
File No. O-12-9189

PLATE NO. 59

GEOLOGIC UNIT DESCRIPTIONS

Unit 11 Unit 11 (From base to top)

11A (1.5'±) Shale, dolomitic, blue-gray and white interbeds; lamellar to very thin bedded (± 1"), moderately hard, scattered fractures, undulating; varies in thickness locally. (Reduces to flat and elongated shards under artificial breaking).

11B (1.5'±) Dolomite, dark gray to brown-gray, dense, cherty, gnarly, very finely crystalline, hard, and very thin bedded (beds 1/2 - 1" but without separations). Bedding often obliterated and replaced by massive unfractured conglomeration of brown and dark gray dolomite in random pattern. Rock is badly fractured with very fine or incipient discontinuous fractures, with dark gray chert common locally (no tripolitic chert).

11C (0.5'±) Dolomite, light gray, very fine grained, (not argillaceous), hard, dense, with considerable healed high-angle fractures with shale veneer. Unit is undulating, massive (bedding indistinct), cherty, black-gray and white, in discontinuous seam along upper contact.

11D (1.5'±) Dolomite, dark gray and brown-gray, mottled, hard, dense, unfractured, (except locally) and massive. Locally, traces of very thin beds, 1/2" and less, deformed and undulating occur without bed separations. This unit may, with small differences, be defined as a sister unit to 11B in texture except that chert is only widely scattered. Beds are not pronounced. The small differences are locally indistinguishable.

11E (1.0'±) Chert, very hard, black and white, oolitic, very thin bedded (beds ± 1-2") intensely fractured and locally vuggy.

Unit 12

$12A_1$ Contact with top of Unit 13 (Base of Unit 12)

(3'±) Dolomite, moderately hard, brown, dark gray to black-gray, massive, hackly, intensely fractured (high angle) in areas of local distortion. This unit reflects a dense, finely crystalline dolomite, that has been severely broken up and redeposited in a random fashion with a softer, lighter gray dolomite as matrix; appearing to weather more easily, this resembling a tripolitic mass. Dark crystalline fragment sizes vary widely. Chert is scattered throughout. Scattered evidence of very thin beds (1-2"), deformed, are in lower 1/2 of the unit. Lower one-half of $12A_1$ consists of a hard dense, blue-gray to brown-gray dolomite portraying a very thin bedded structure (beds one-inch thick and less) deformed and distorted. Mass looks like whorls around large chert nodules intensely fractured and broken. Deformation and distortion common. Seepage avenues with accompanying permineralization locally prominent.

$12A_2$ (1.5'±) Dolomite, hard, light gray, very fine grained, sandy, thin bedded (1"-6") but with relatively indistinct bedding separations. Unit is gnarly with considerable number of healed, discontinuous, vertical and high angle fractures.

$12A_3$ (0.5'±) Chert, very hard, oolitic, dense, blue, brown, and gray, lightly fractured with intense fracturing associated with undulations.

$12B_1$ (1.0'±) Dolomite, tan-gray, massive, hackly (resembles pebble conglomerate locally), unfractured, and capped with a black and white 1" chert band, lightly fractured, and strongly tripolitic.

STAGE III CONSTRUCTION

Truman Dam and Reservoir, Missouri

Mapping - Spillway Powerhouse Area

GEOLOGIC UNIT DESCRIPTIONS

$12C_1$ (6.5'±)

Dolomite, brown-gray, hackly, massive, but possessing bedding locally that is generally indistinct. Unit appears sandy, very fine grained at the base but reflects a transitional finer texture toward the top. Argillaceous appearance is characteristic near top of unit. Oolitic dark gray and blue chert mixed with dark gray dense dolomite, produces a mottling appearance that can locally be defined as bedding, very thin (beds 1 - 3"). This unit resembles a conglomeration of units (more than one) mixed together prior to the completion of lithification and redeposited in a deformed distorted mass.

$12C_2$ (1.5'±)

Dolomite, gray and tan-gray, very fine grained, very thin bedded, (beds 3" and less), intensely fractured, gnarly, with scattered discontinuous chert seams locally deformed, distorted, and undulating.

$12B_2$ (1.0'±)

Dolomite, moderately hard, pink to tan-gray, very thin bedded, (beds 3 - 5"), argillaceous appearing, unfractured except for scattered high angle fractures marked by shale veneer. This unit is capped and based with shale stringers, blue-gray, lamellar, soft to moderately hard, with blue and white chert scattered throughout the shale. Considerable undulation is noted in the shale.

$12B_{2a}$

Locally identified as shale with chert prominent enough to be considered as an independent subunit.

Unit 13

Dolomite, light gray, uniformly very fine grained, argillaceous, scattered high angle healed fractures with shale veneer, very thin bedded with shale veneer along bedding plane (no separations) massive appearing, undulating. Unit bounded at the base by the "S" chert horizon and at 1'± below the top by a prominent stringer of chert 1" thick, continuous, blue and white, very hard, and undulating with the unit. Chert is locally interlaced with lamellar blue-gray shale.

"S"

Chert, blue and white, very hard, badly fractured with dark gray, dense, dolomite fragments, tripolitic (white) chert, and barite deposits widely scattered throughout. Black and gray shale interstices locally common. Iron stain on exposures prominent. This unit forms the base and is identified with Unit 13.

Unit 14

This unit is generally uniformly hackly portraying secondary deposition or a redeposition of semilithified primary sediments earlier distrubed by possible wave action. The unit is considered hackly, locally vuggy and possessing white tripolitic chert bands on a spacing of 6 to 10" (notably 5 bands passing through the center of the unit). This unit is bounded by chert zones each identified individually. There is some evidence that this unit doubles in thickness (2X7 or 8') on the powerhouse wall indicating possible translational movement along a bedding plane (bedding plane fault)

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CONSTRUCTION FOUNDATION REPORT

GEOLOGIC UNIT DESCRIPTIONS
SPILLWAY
POWERHOUSE EXCAVATION

Date MARCH 1985

Title No. 0-12-9190

PLATE NO. 60

GEOLOGIC UNIT DESCRIPTIONS

Unit 14A rests atop Unit 15C, the sandy unit of 15.

Unit 14A - Dolomite, and chert, light gray to dark gray, hard, dense to crystalline, badly fractured (fracture internal (1-3") very thin bedded (beds 1/2"-4") capped with white to blue gray discontinuous chert seam, very hard and lightly fractured. Estimated thickness 1 - 1.5'.

Unit 14B - Dolomite, hackly, moderately hard, gray to brown gray (locally), lightly tripolitic with 5 nearly continuous hard white tripolitic chert seams 1/4-1" thick on 6 to 10" spacings. Within the five bands is confined the vuggy formation with vugs not larger than 1" diameter. No interconnections are apparent.

Unit 14C - Dolomite, cherty, hard, dense, finely crystalline, gray to black gnarly, with interbeds (indistinct) of brown gray dolomite. Chert, crystalline and tripolitic scattered throughout with nearly continuous seam of blue-gray and white chert on upper contact with Unit 13. Unit appears massive with indistinct beds and locally deformed and/or distorted.

Unit 15

15A — Contact with top of Unit 16 (Base of Unit 15) Dolomite, moderately hard, brown gray, massive, strong pattern of incipient healed fracture with pyrolusite or shale veneer in random pattern. No bedding orientation except locally deformed striae blue-white and black chert randomly oriented and scattered throughout, very fine grained.

15B — Dolomite, very hard, dark gray, dense, massive, but containing very thin beds of cyclic deposition ranging from black-gray to light gray, (beds 1/4"+) without distinct separation planes. Bedding strongly deformed and distorted with considerable blue-gray and white chert bands distorted and deformed penetrating at random throughout the mass. Texture is sandy (but fine grained). Chert comprises the majority of the whole in local instances.

15C — Dolomite, sandy, medium grained, resembling possible fossil debris, massive, light gray, (bedding not apparent) scattered traces of one chert band, undulating but continuous portraying a specific temporal horizon. This band is about 2' from base of 15B, 0.2' thick blue-gray, and oolitic. Above the band appears a lightly tripolitic and hackly texture. Tripolitic chert bands discontinuous but resembling the same temporal horizons are scattered more prominently in the upper 1/2 - 1/3 of 15C. Spacing 3-6".

15D — Dolomite, light (white) gray, moderately hard, very thin bedded (1/2-3") medium grained sandy texture, not in contact with 15C to very fine argillaceous texture in contact with U14. Unit undulates. Unit contains some minute vugs and considerable number of high angle fractures. Shale veneer common on beds and on high angle fractures locally.

Unit 16

Dolomite, very fine grained, massive to very thick bedded, (beds 12±)containing shale veneer (may be defined as shale stylolites - see 16 definition KCDO). Bottom third is tripolitic, with thin beds of tripolitic chert, one of which is continuous one-fourth up from unit base. One-third up from unit base is stylolitic shale seams 1/2" on center for a thickness of 3-4 inches. Above the shale, the dolomite portrays an aphanitic texture with considerable perpendicular and high angle fractures healed or containing a shale veneer. Fracture frequency 4 in 12 inches.

III CONSTRUCTION

Dam and Reservoir, Missouri

g - Spillway Powerhouse Area

GEOLOGIC UNIT DESCRIPTIONS

Unit 17

A_3 - Base of 17
Shale, moderately hard, gray and green gray, lamellar, but possessing massive characteristics, widely scattered fractures, healed, undulating, deformed occasionally and containing scattered white chert nodules, bounded by white chert seams and nodules relatively discontinuous. Chert seams serving suitable markers immediately below and above the shale with greater chert concentration at the base.

A_2 Dolomite, gray, moderately hard, massive, gnarly, tripolitic upper half, with trace of hard, dark gray and blue, discontinuous, chert zone midway throughout the unit. Scattered blue and white chert throughout the lower half. Unit possesses very fine grain, sandy texture.

A_1 Dolomite, very thin bedded, (beds 1/4 to 1"), moderately hard, brown-gray, unfractured, (possessing massive characteristic), and containing very fine grain sandy texture. (This unit may be the top of the massive tripolitic unit defined by A_2 as tripolitic rock is exposed on the 583 floor)

A Dolomite, dark gray, moderately hard, very thin bedded, (beds 1-3"), intensely fractured, with bands of chert, white, gray, scattered in uniformly horizontal orientation throughout. Unit is capped with white chert band, 1±" thick. Fractures noted are healed and partially healed. Upper section is sandy dolomite, very fine grained.

B Dolomite, massive to thick bedded, gray, moderately hard.
Upper 1.5' - Unit is tripolitic, vuggy, indicating some solution cavitation in the sandy tripolitic zone.
Lower 2.5' - Shale veneer on beds 1-6" thick with no separation planes. Fractures are scattered and healed. Dolomite is smooth, aphanitic, and massive in appearance with scattered bands of white chert in the lower 1/4 of the unit.

C Chert, light gray to white, very hard, sandy, very fine grained with some gray shale lenses. Lower contact is tripolitic, soft, white, 1/2-3" thick.

D Dolomite, gray, massive, lightly tripolitic, sandy, (coarsely crystalline), locally vuggy, and scattered discontinuous shale veneers. Unit is sandy, moderately hard.

E Chert, dark gray to blue, very hard, lightly fractured, massive.

E Top of Unit 17.

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CONSTRUCTION FOUNDATION REPORT
GEOLOGIC UNIT DESCRIPTIONS
SPILLWAY
POWERHOUSE EXCAVATION

Scale
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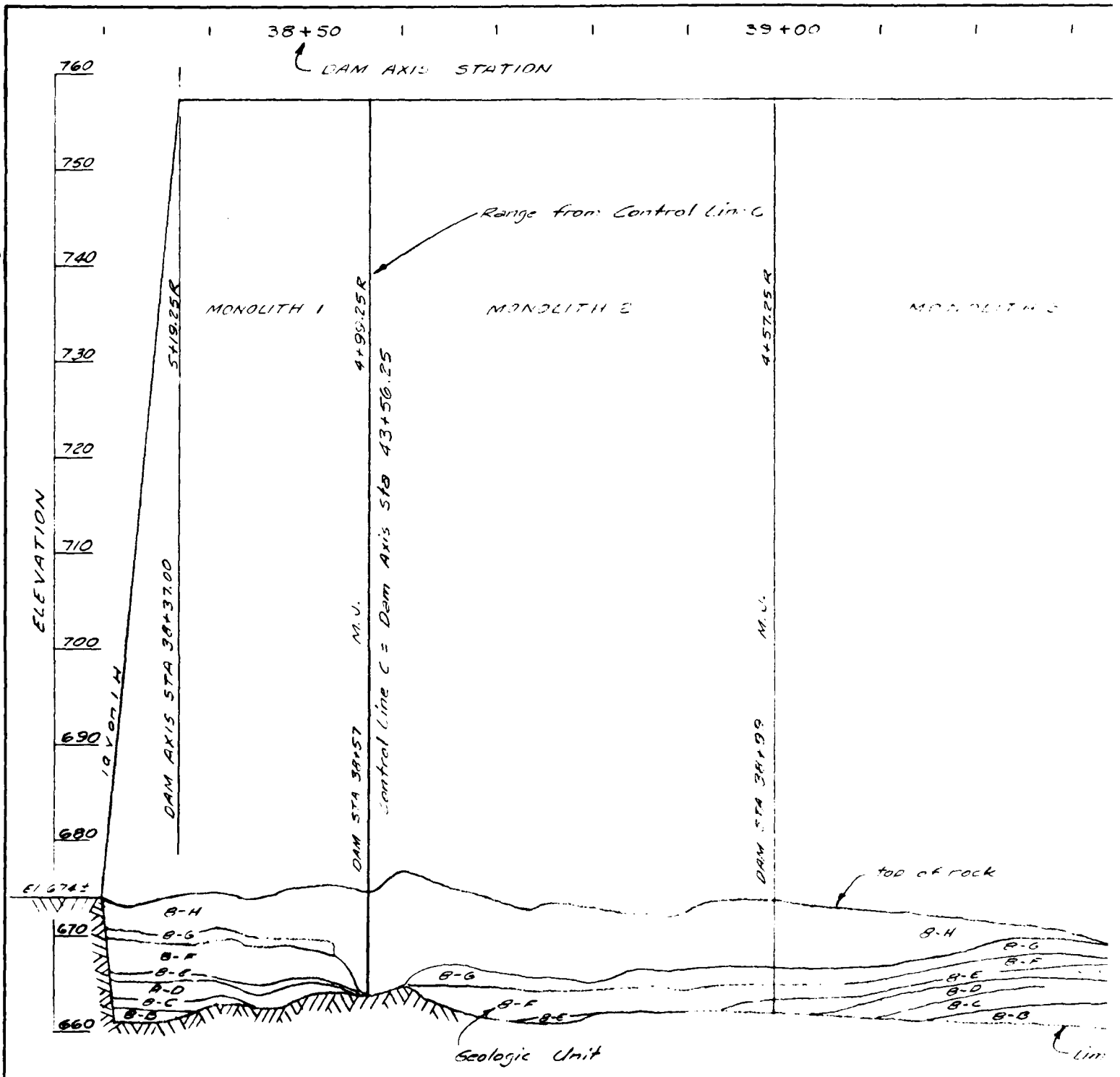
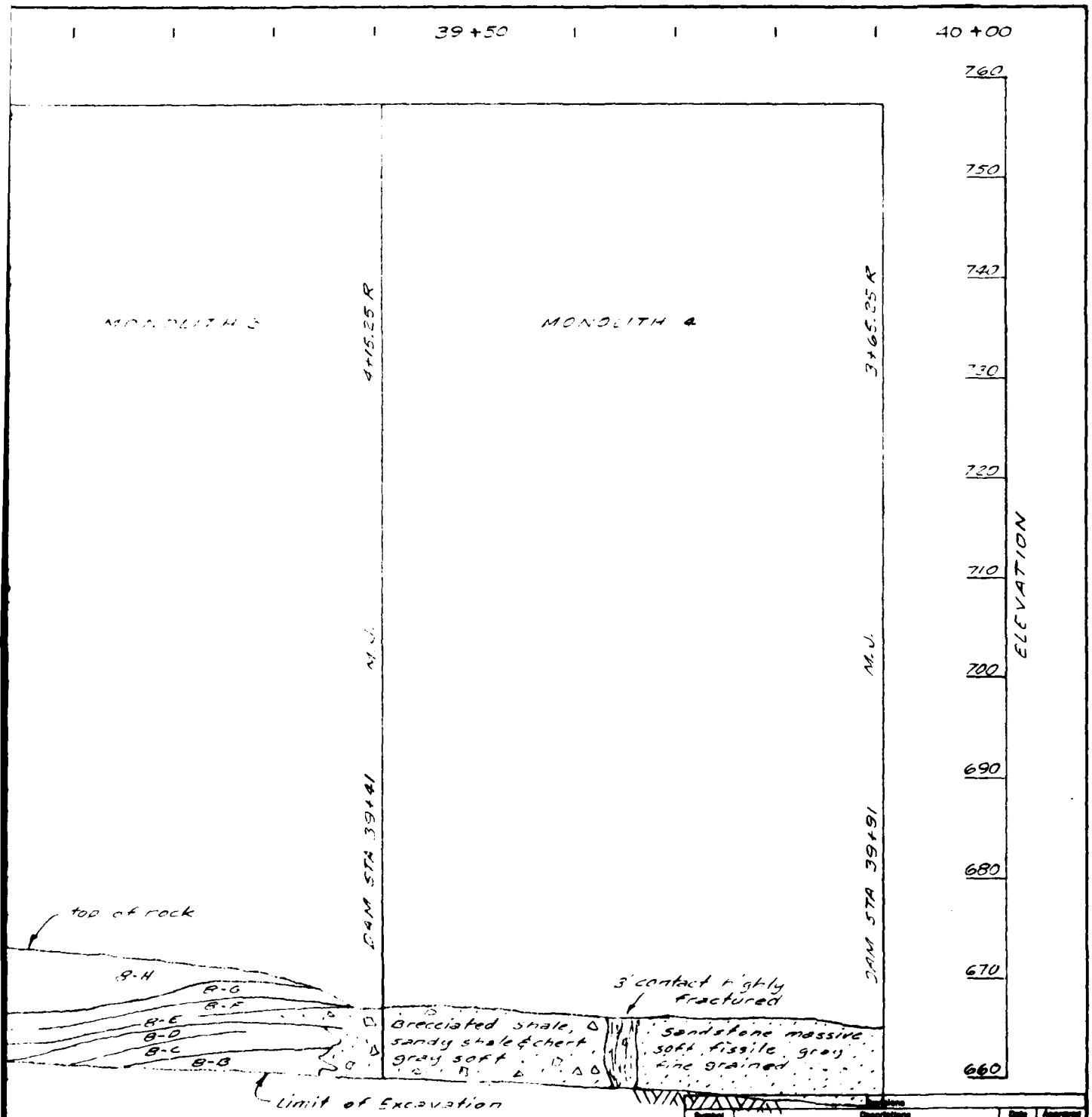
Date MARCH 1966
Dwg No
File No. 0-12-9191



STAGE III UPSTREAM FACE EXCAVATION NON-OVERF
1 THRU 4 ELEVATION AT R
LOOKING UPSTREAM

For Legend See Plates 59, 60 & 61

0 10
SCALE IN FEET



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UPSTREAM FACE EXCAVATION NON-OVERFLOW MONOLITHS 1 THRU 4

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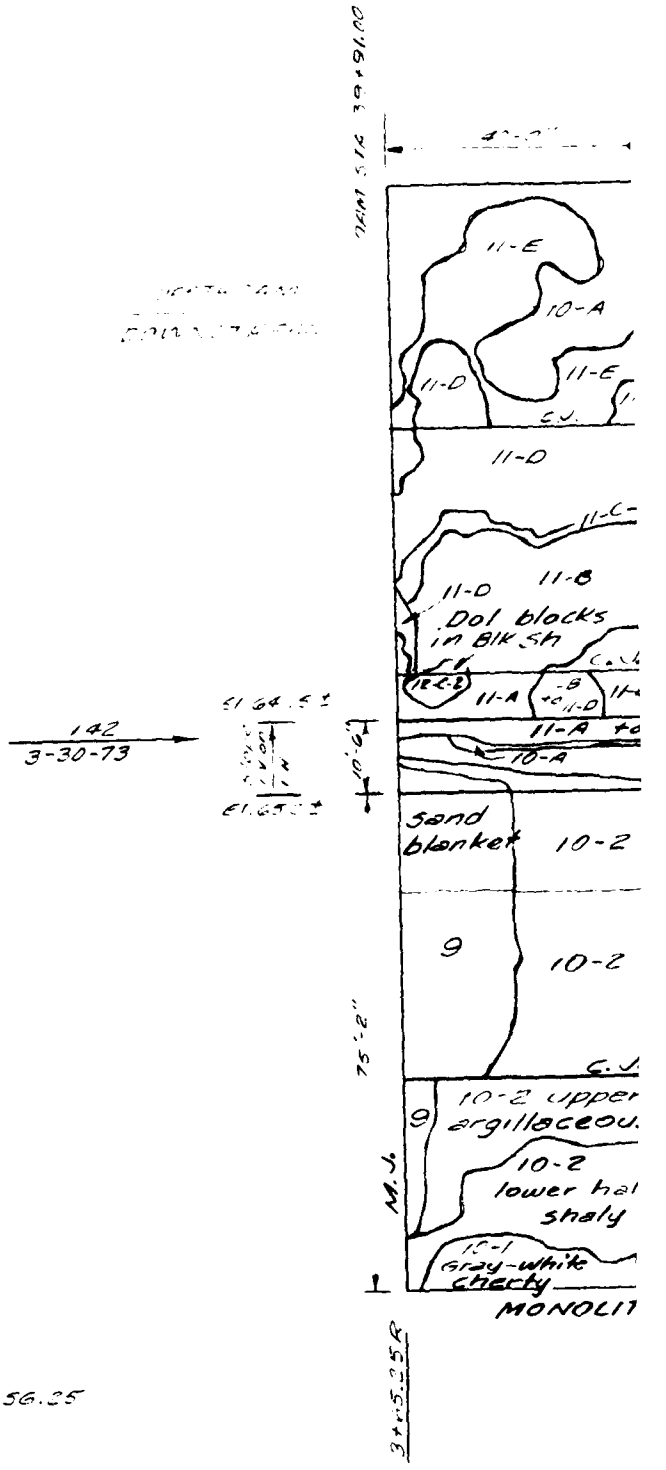
...ON NON-OVERFLOW MONOLITHS

...4 ELEVATION AT R 0+18.25 UP

10
IN FEET

PLATE NO. 62



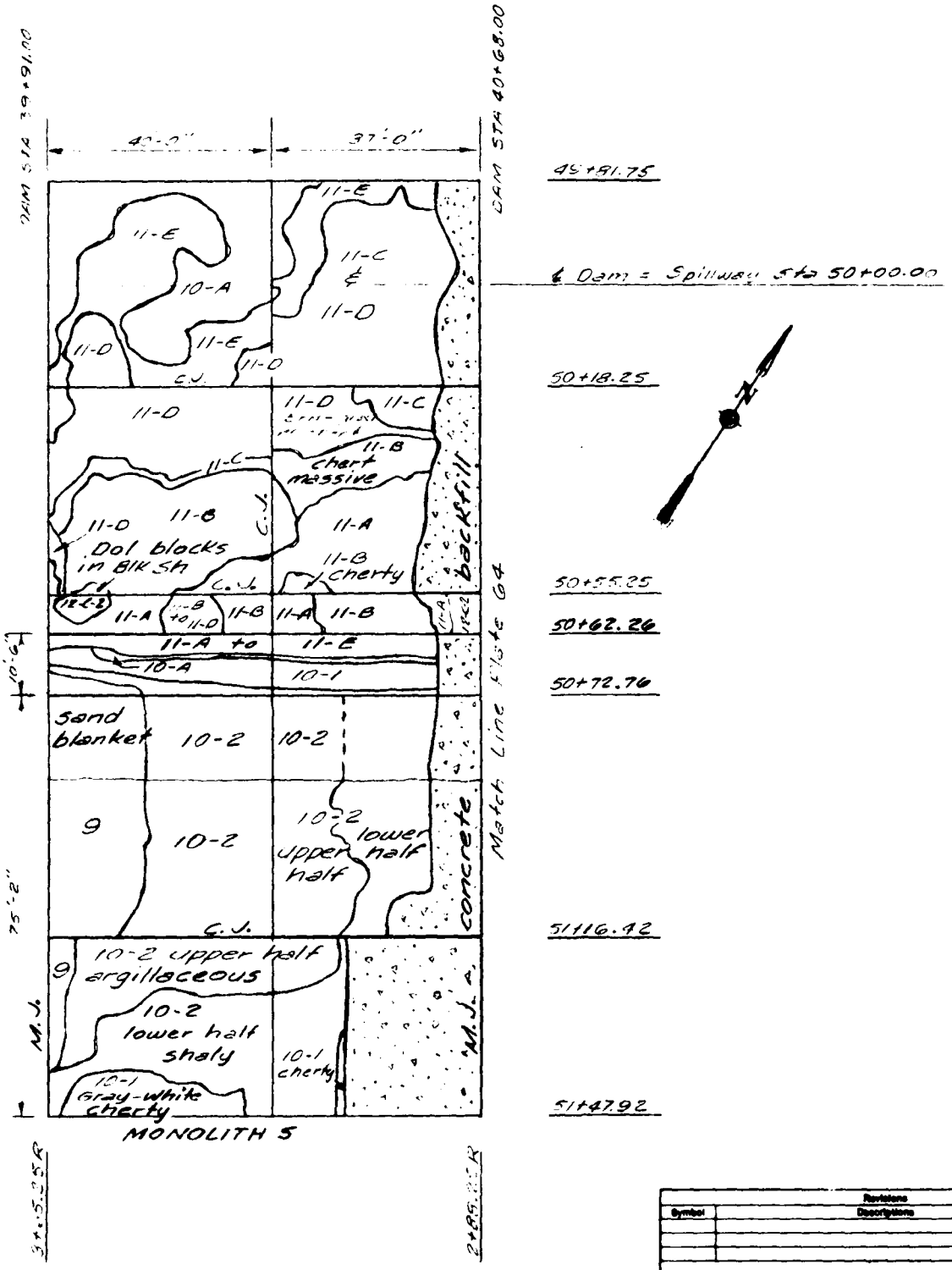
Range From Control Line C
Control Line C = Dam Axis Sta 43+56.25

STAGE III

FOUNDATION MAP ERECTIO
MONOLITH 5

For Legend See Plates 59, 60 & 61

0 80
SCALE IN FEET



ON MAP ERECTION BAY
OLITH 5

0 20
SCALE IN FEET

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FOUNDATION MAP ERECTION BAY MONOLITH 5

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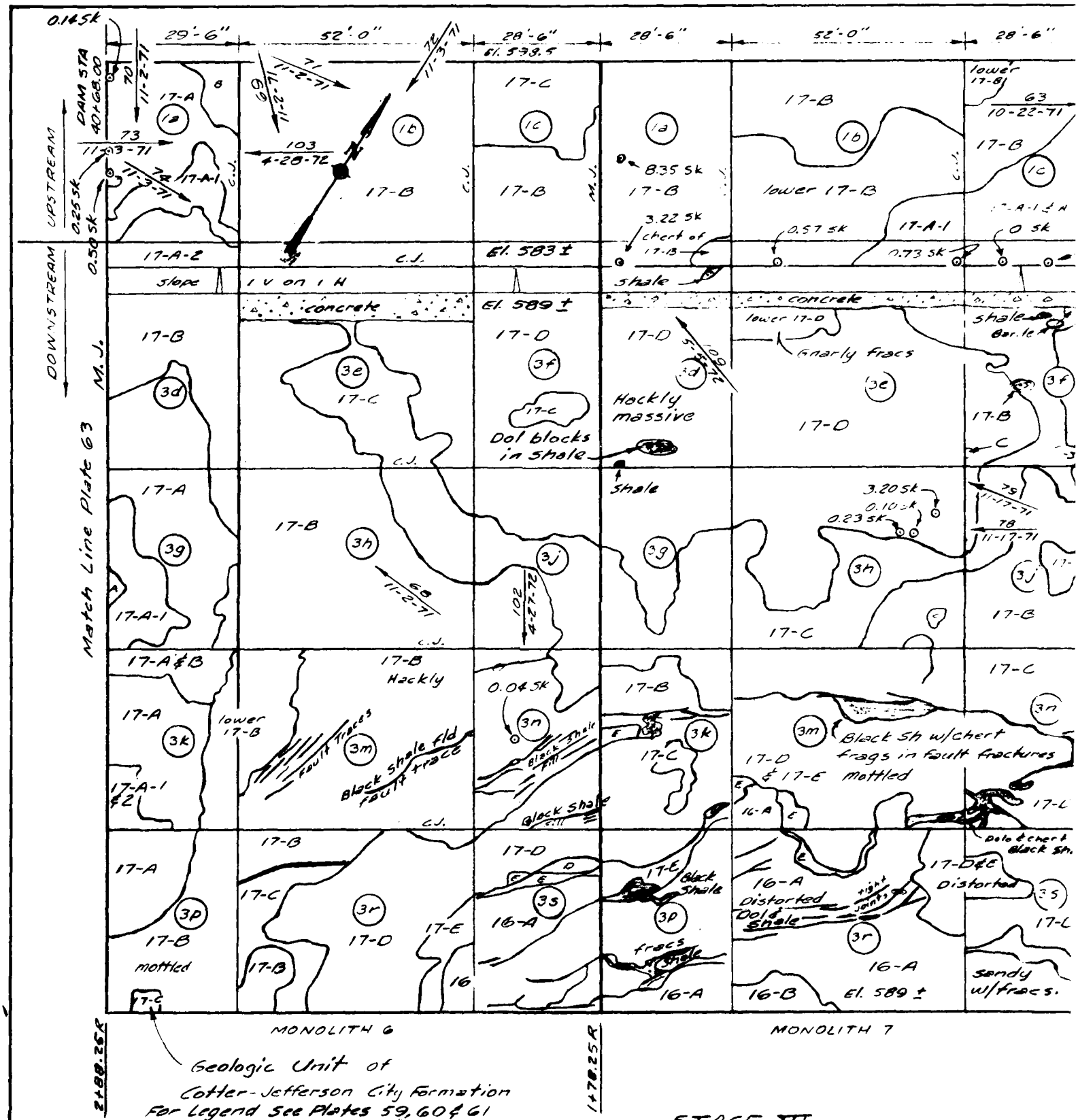
PLATE NO. 63



STAGE III

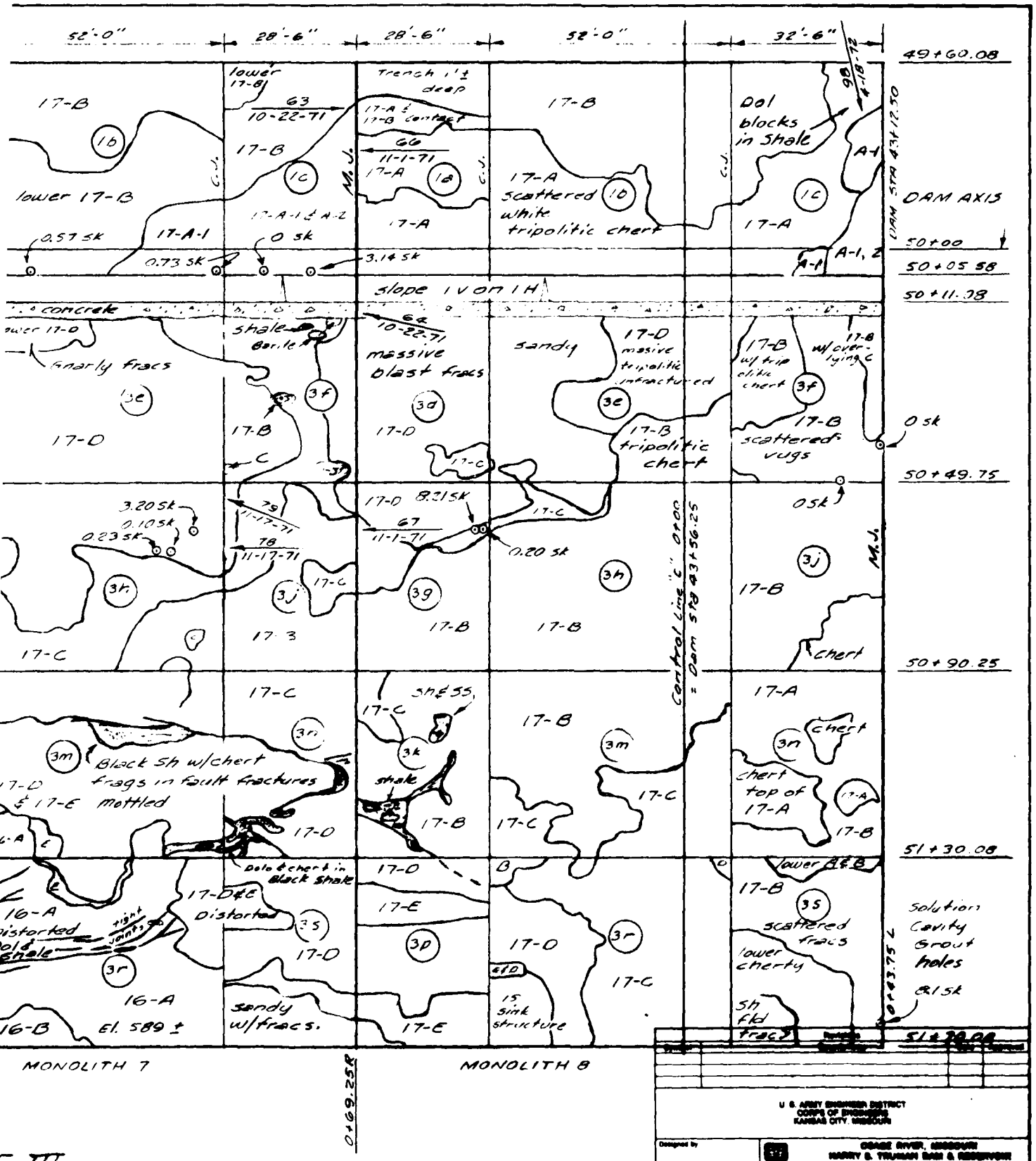
FOUNDATION MAP POWERHOUSE MONOLI

Range From Control Line C
Control Line C = Dam Axis Sta 43+56.25

(1a) ← Concrete Pour No. First Lift

0 20 SCALE IN FEET

71 / 11-2-71 Direction Number & Date of Photo



E III

VERHOUSE MONOLITHS 6, 7 & 8

71 / 11-2-71 — Direction Number & Date of Photo

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FOUNDATION MAP POWERHOUSE
MONOLITHS 6, 7, & 8

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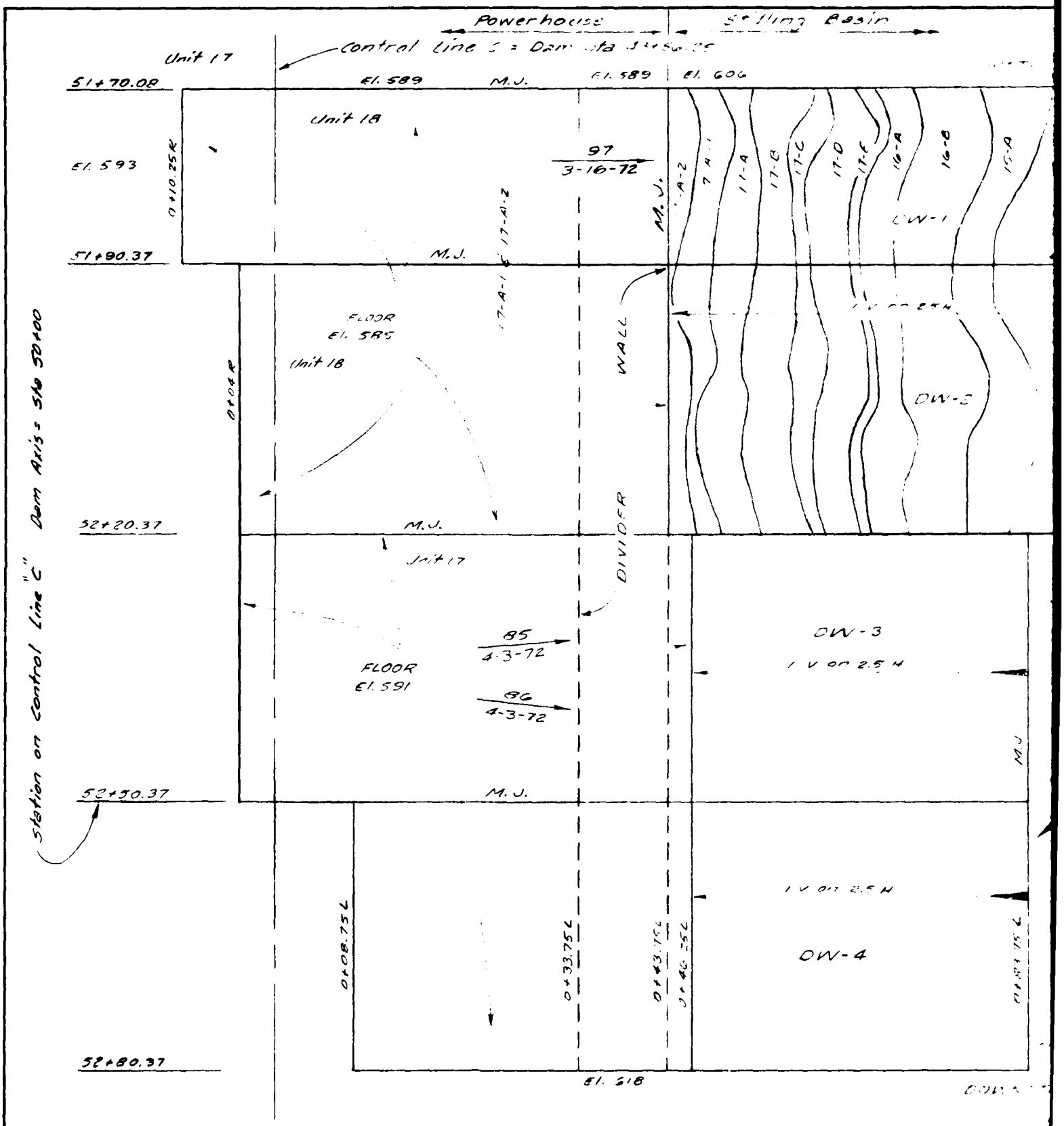
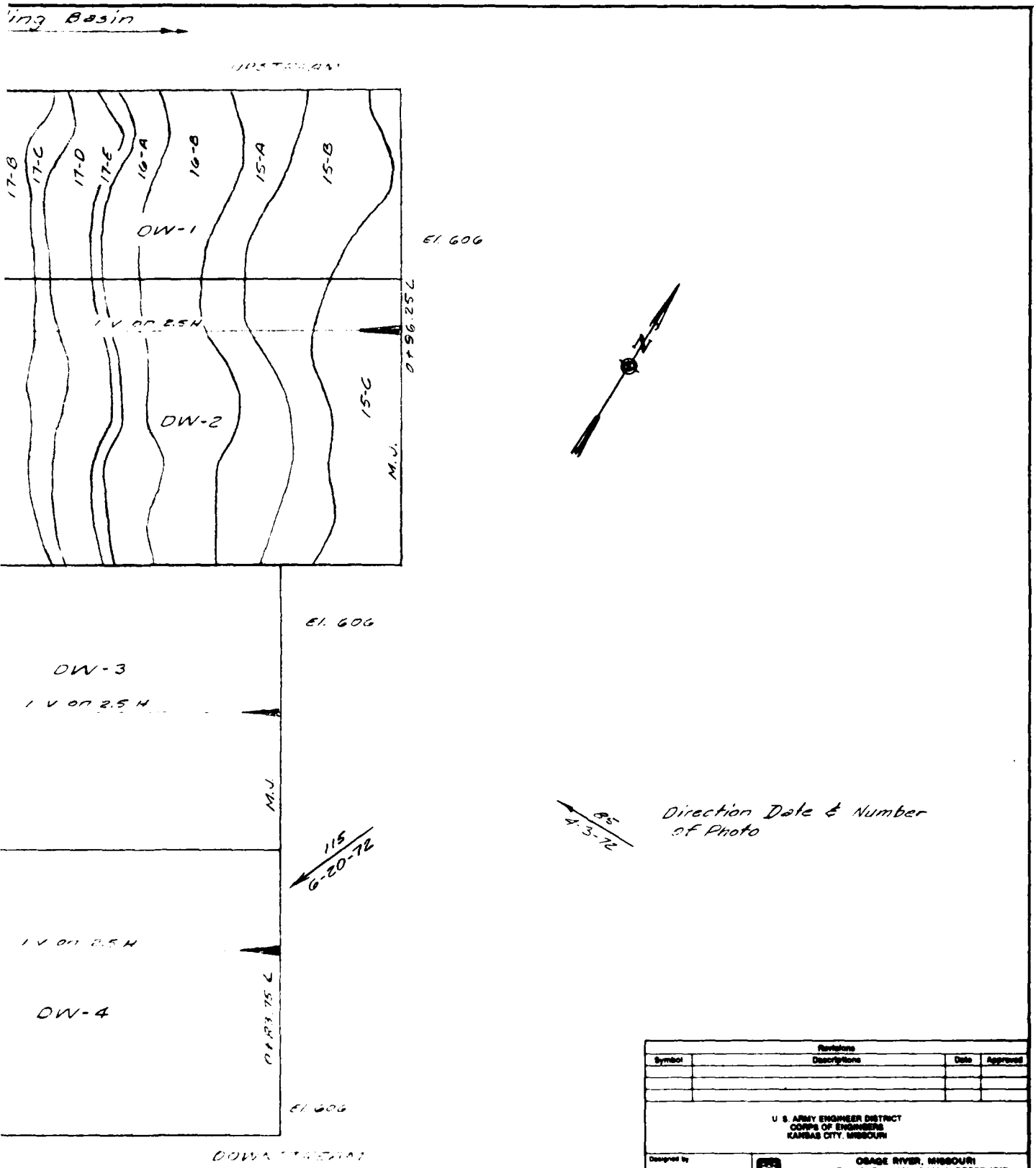
PLATE NO. 64



STAGE III FOUNDATI N MAP DIVIDER WALL AREA

For Legend See Plates 59, 60 & 61

SCALE IN FEET



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FOUNDATION MAP
DIVIDER WALL AREA

Scale

Sheet number

Date: MARCH 1968

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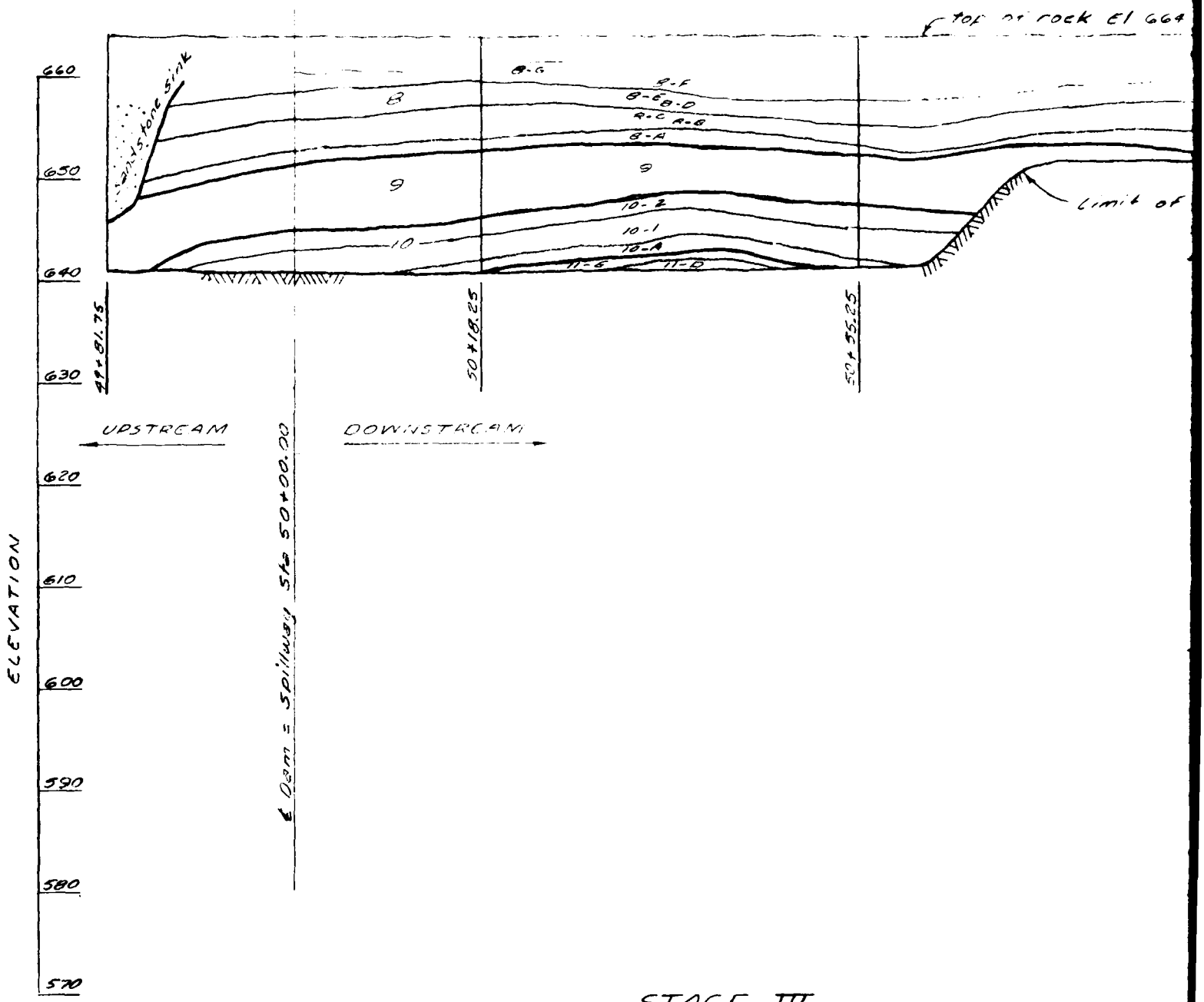
File No. 0-12-9195

PLATE NO. 65



STAGE III

POWERHOUSE ERECTION BAY AND SUMP EXCAVATI

LEFT WALL

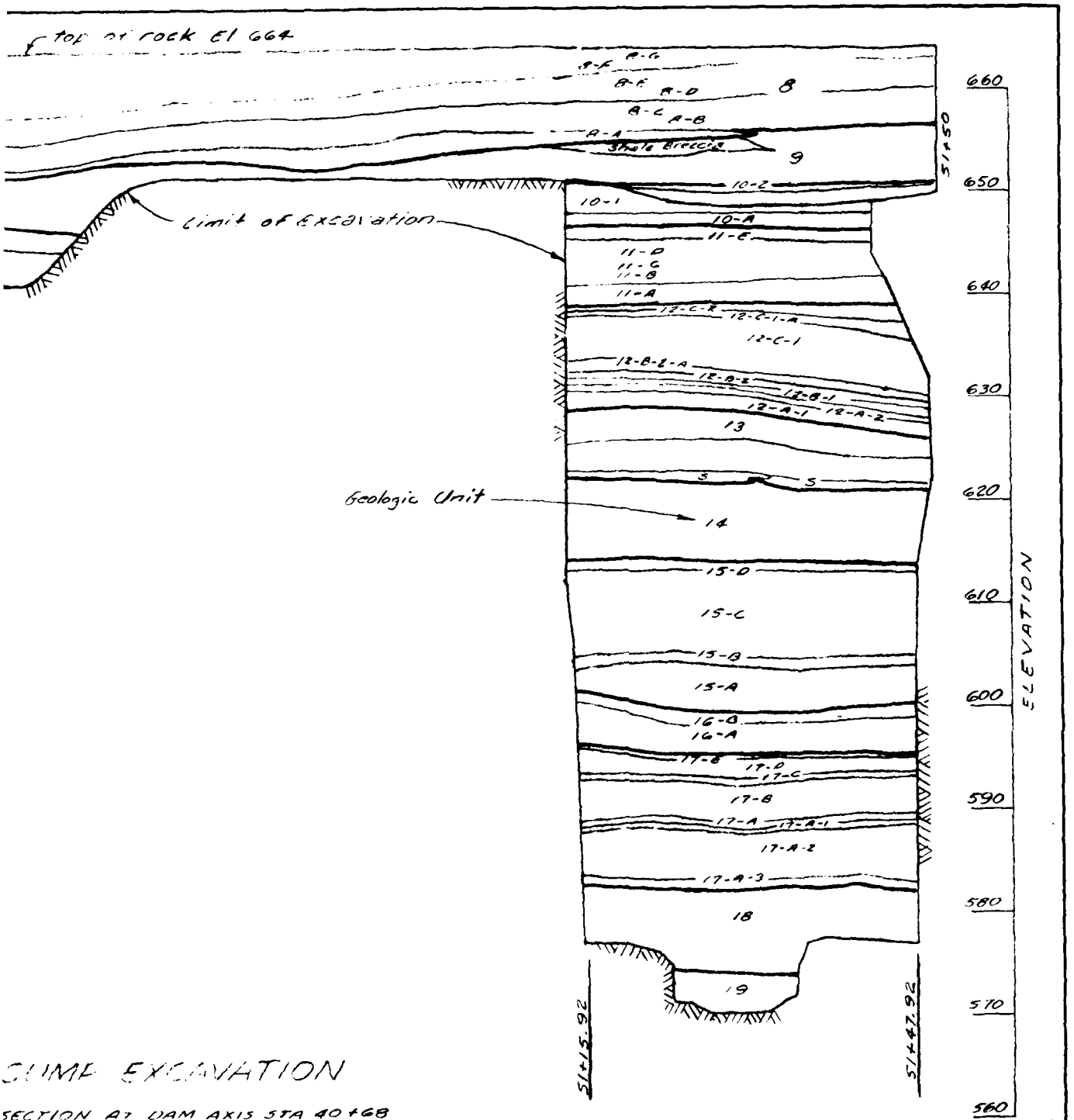
SECTION AT DAM AXIS STA

CONTROL LINE C RANGE 2

0 10

SCALE IN FEET

For Legend See Plates 59, 60 & 61



SUMP EXCAVATION

SECTION AT DAM AXIS STA 40+68
CONTROL LINE C RANGE 21+89.75 R

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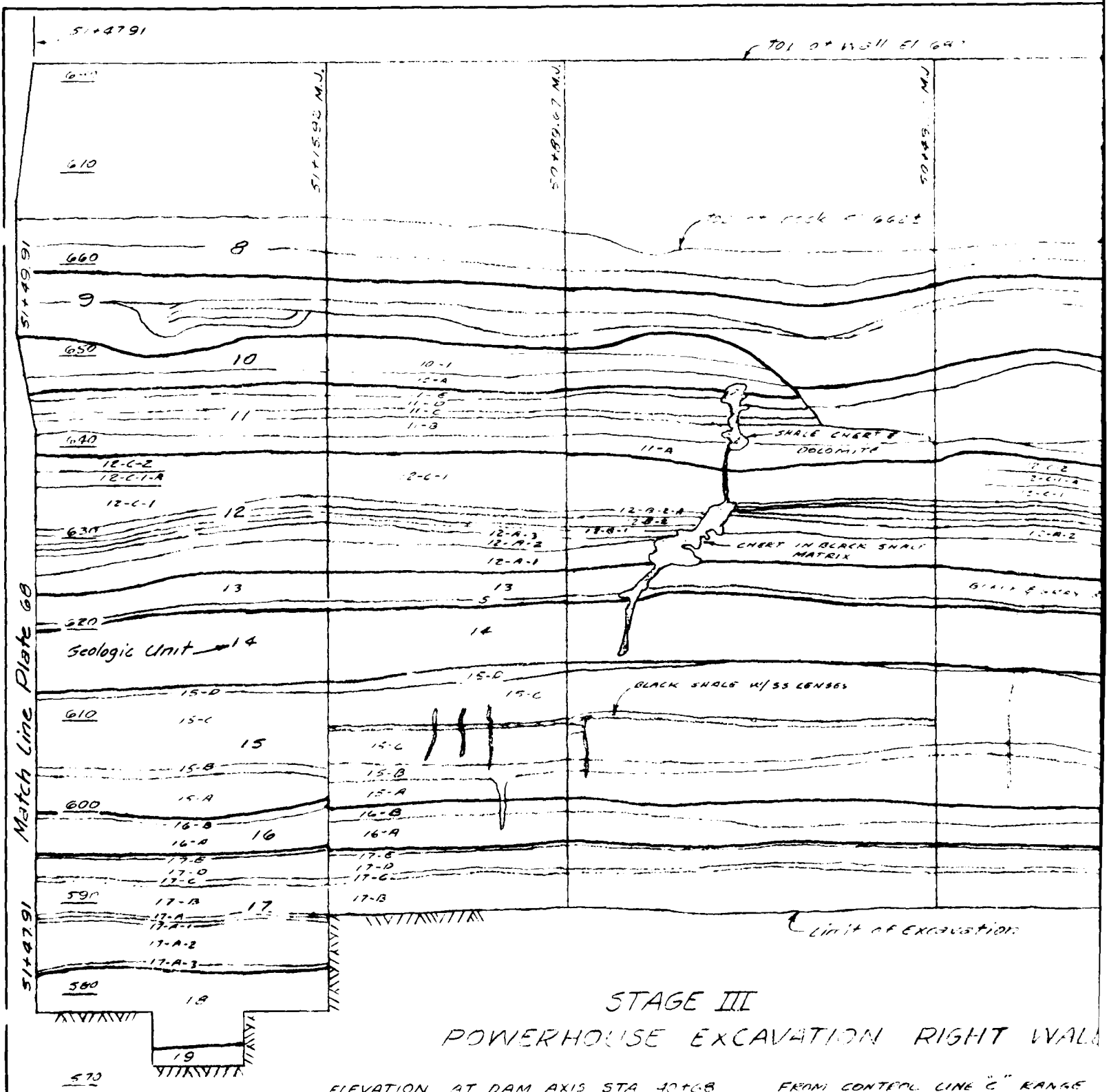
POWERHOUSE ERECTION BAY & SUMP EXCAVATION LEFT WALL

Date: MARCH 1986
File No. 0-12-9186

PLATE NO. 66



STAGE III

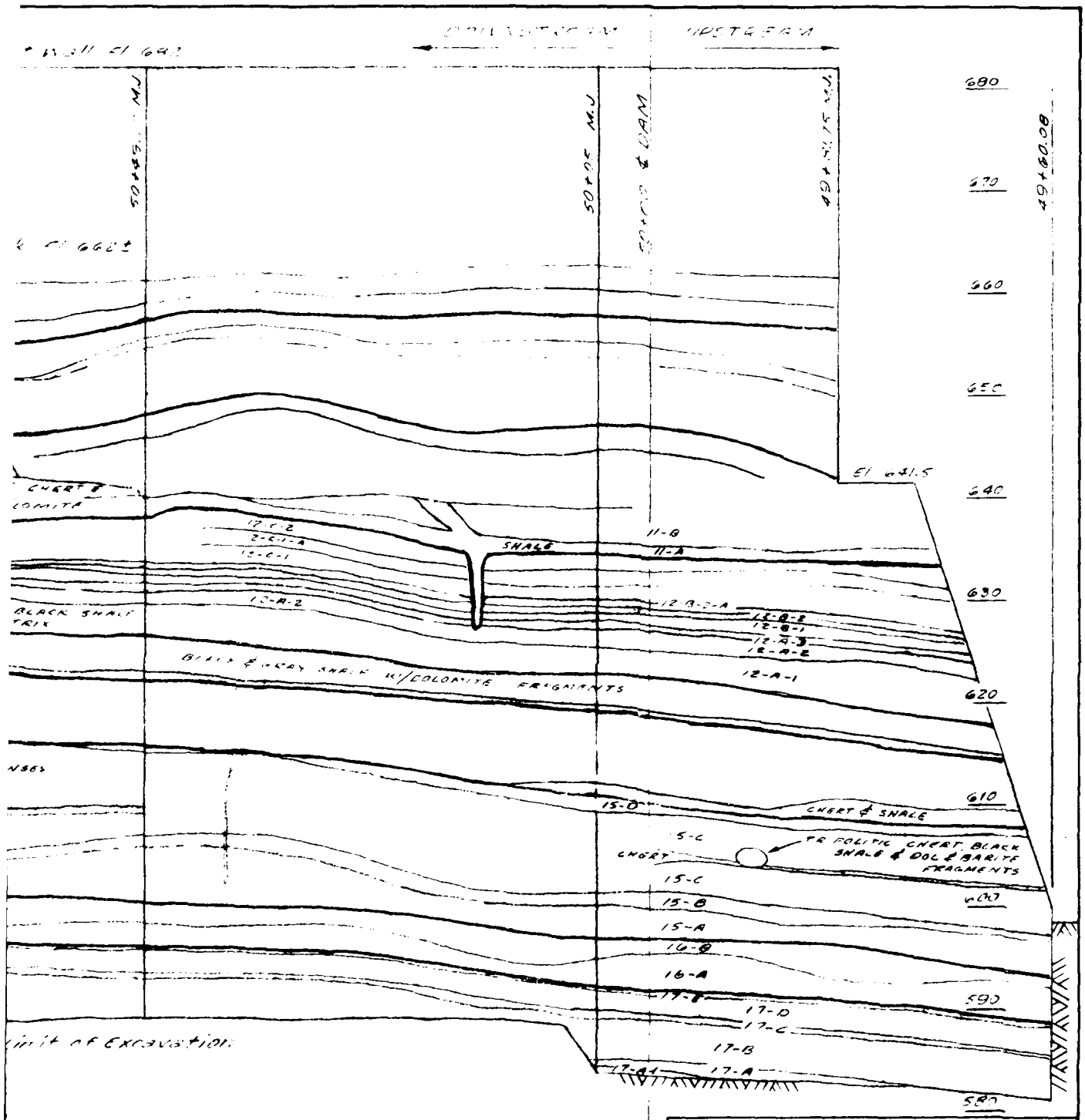
POWERHOUSE EXCAVATION RIGHT WALL

ELEVATION AT DAM AXIS STA 40+68 FROM CONTROL LINE "C" RANGE

0 10

SCALE IN FEET

For Legend See Plates 59, 60 & 61



TION RIGHT WALL

CONTROL LINE "C" RANGE 21+88.25 R

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POWERHOUSE EXCAVATION
RIGHT WALL

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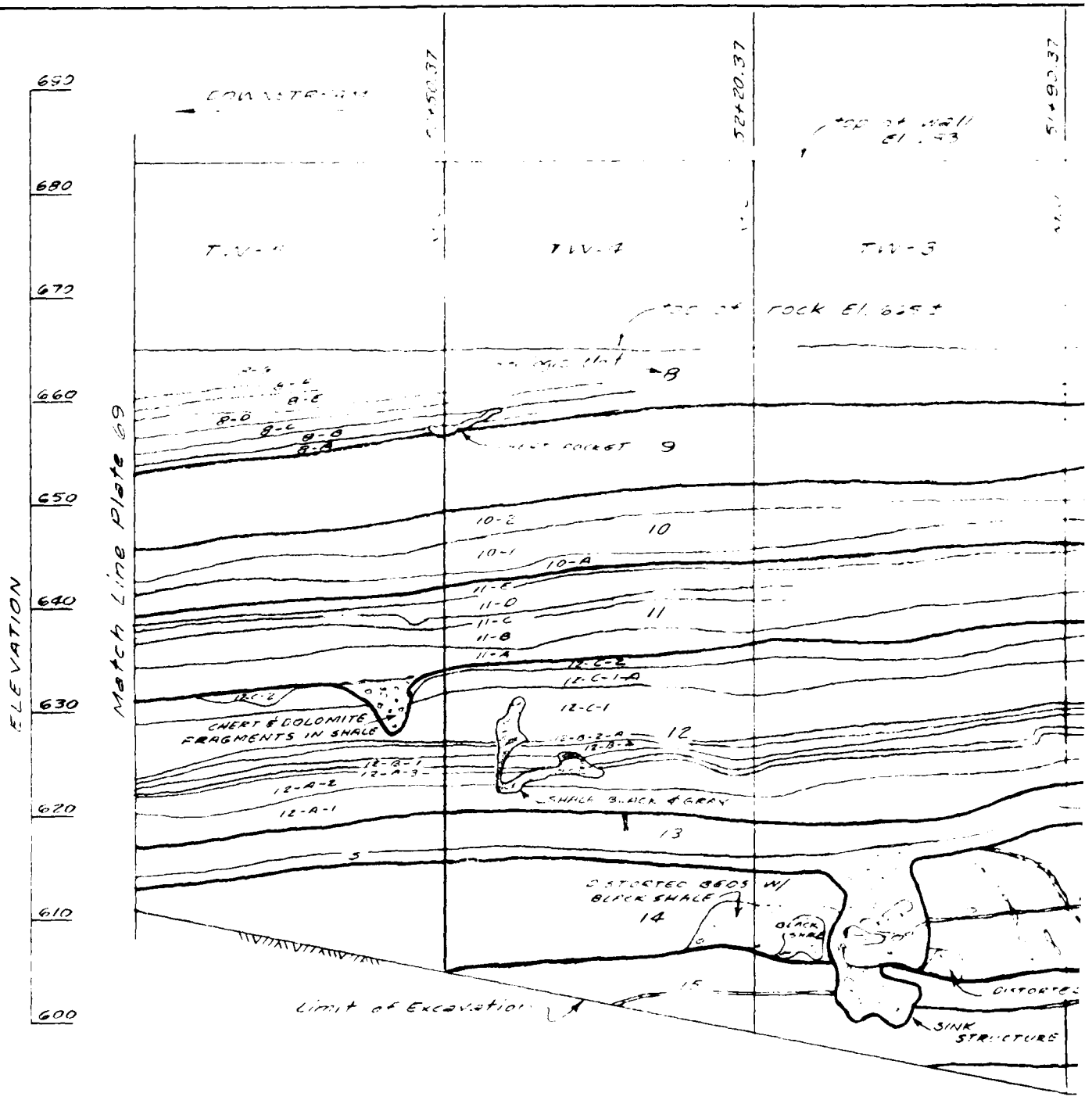
PLATE NO. 67



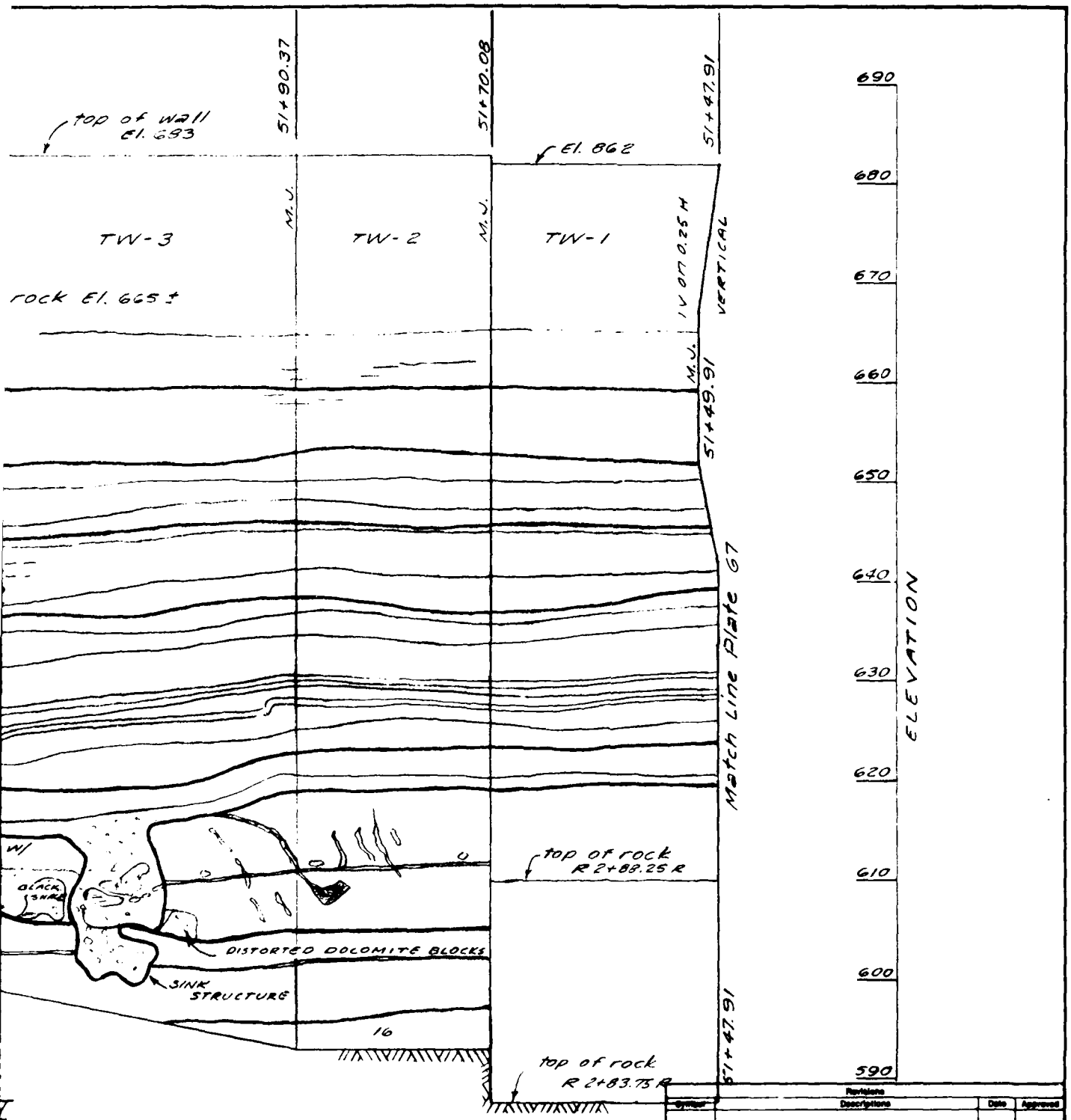
STAGE III

TAILRACE EXCAVATION RIGHT WALL

ELEVATION AT ℄ ... AXIS STA 50+68 ... CONTROL LINE "C" ...

For Legend See Plates 59, 60 & 61

SCALE IN FEET



RIGHT WALL STA 52+80 TO STA 51+47

ONTROL LINE "C" RANGE 2+88.25 R

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TAILRACE EXCAVATION
RIGHT WALL

Scale
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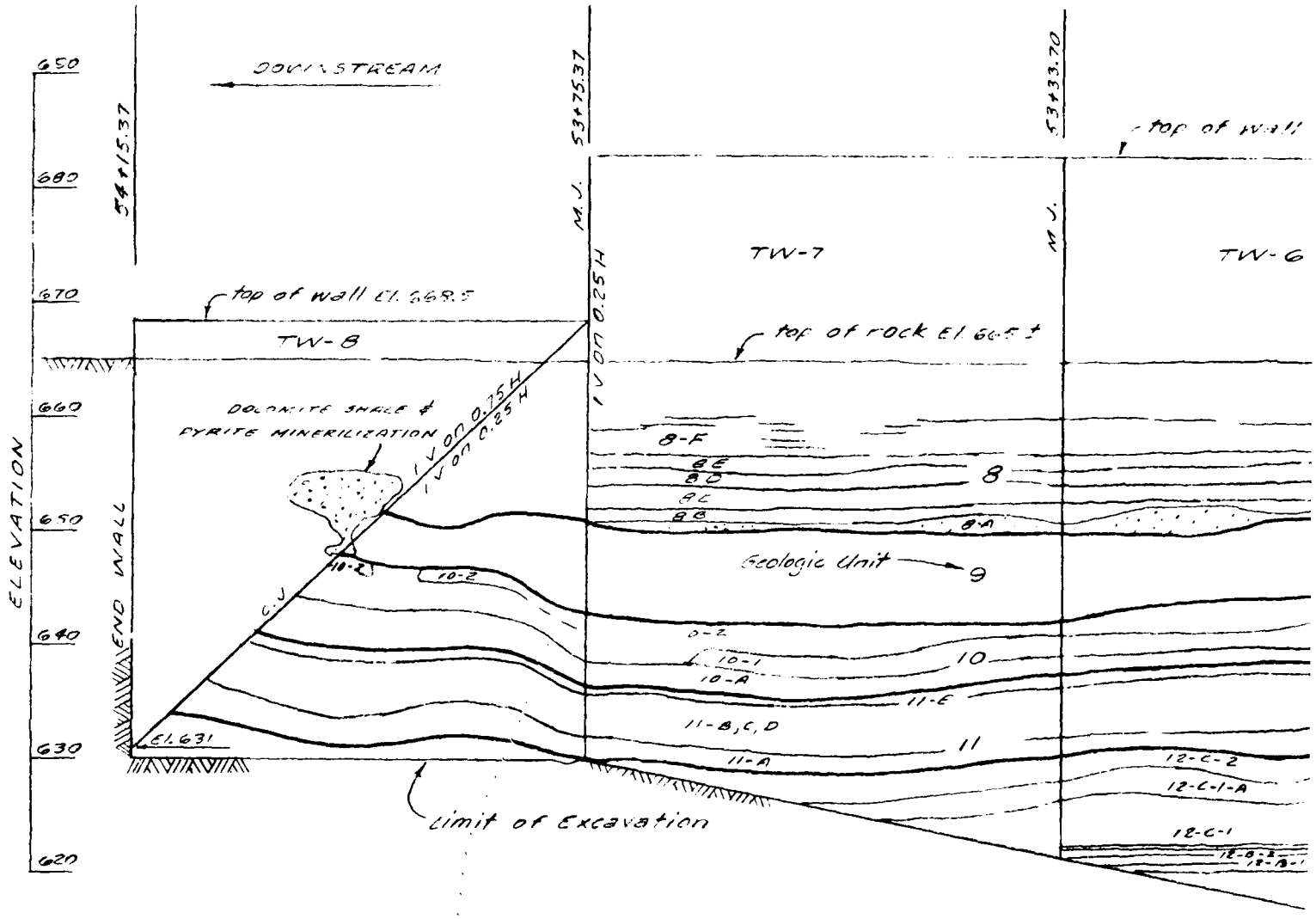
File No. 0-12-9198

PLATE NO. 68



STAGE III

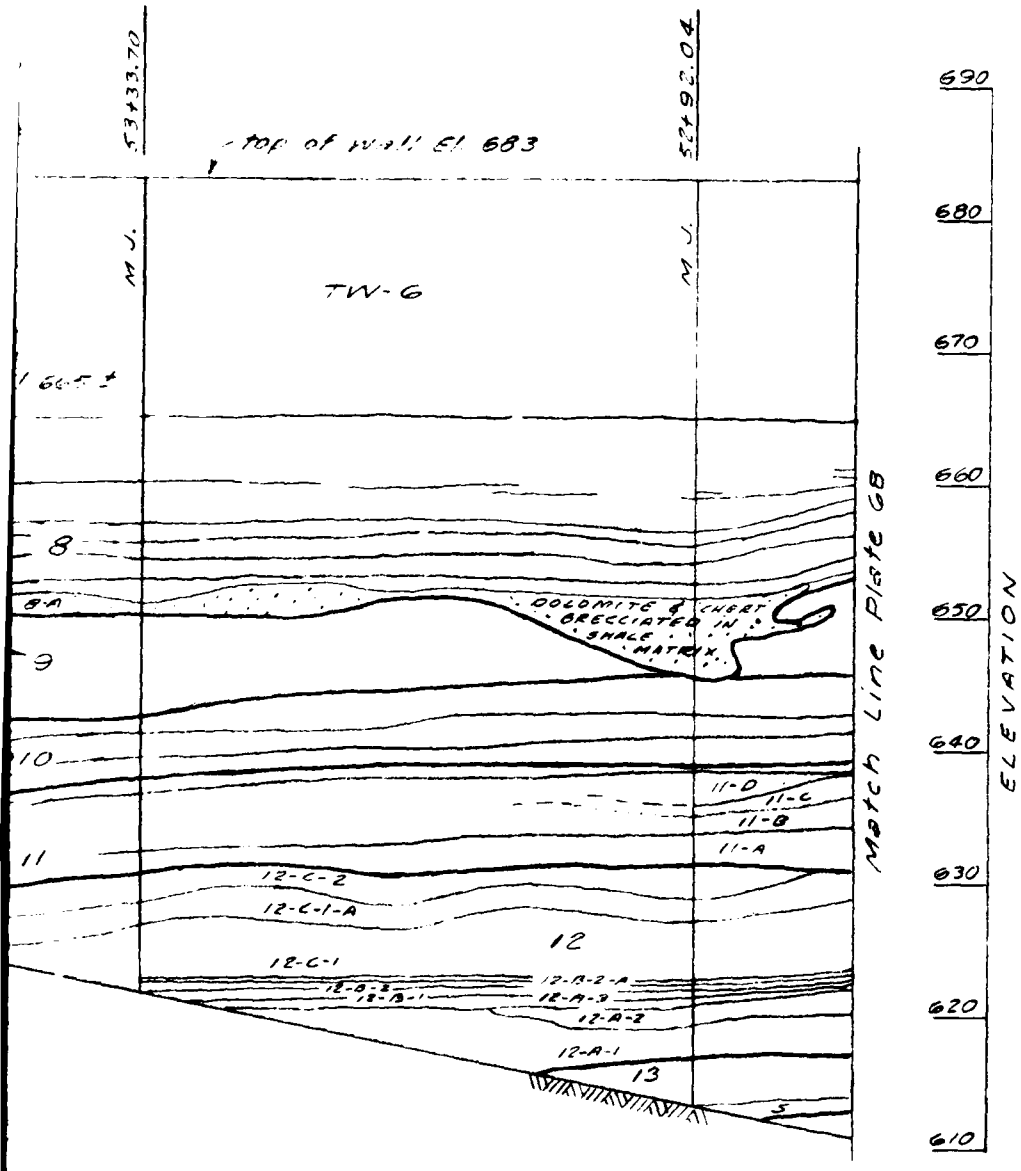
TAILRACE EXCAVATION RIGHT WALL STA

ELEVATION AT STA 40+68 FROM CONTROL LINE "C" RANGE 2+88.25 R

For Legend See Plates 59, 60 & 61

0 10

SCALE IN FEET



IGHT WALL STA 54+15 TO STA 52+80

E 2+88.25 R

10
FEET

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TAILRACE EXCAVATION
RIGHT WALL

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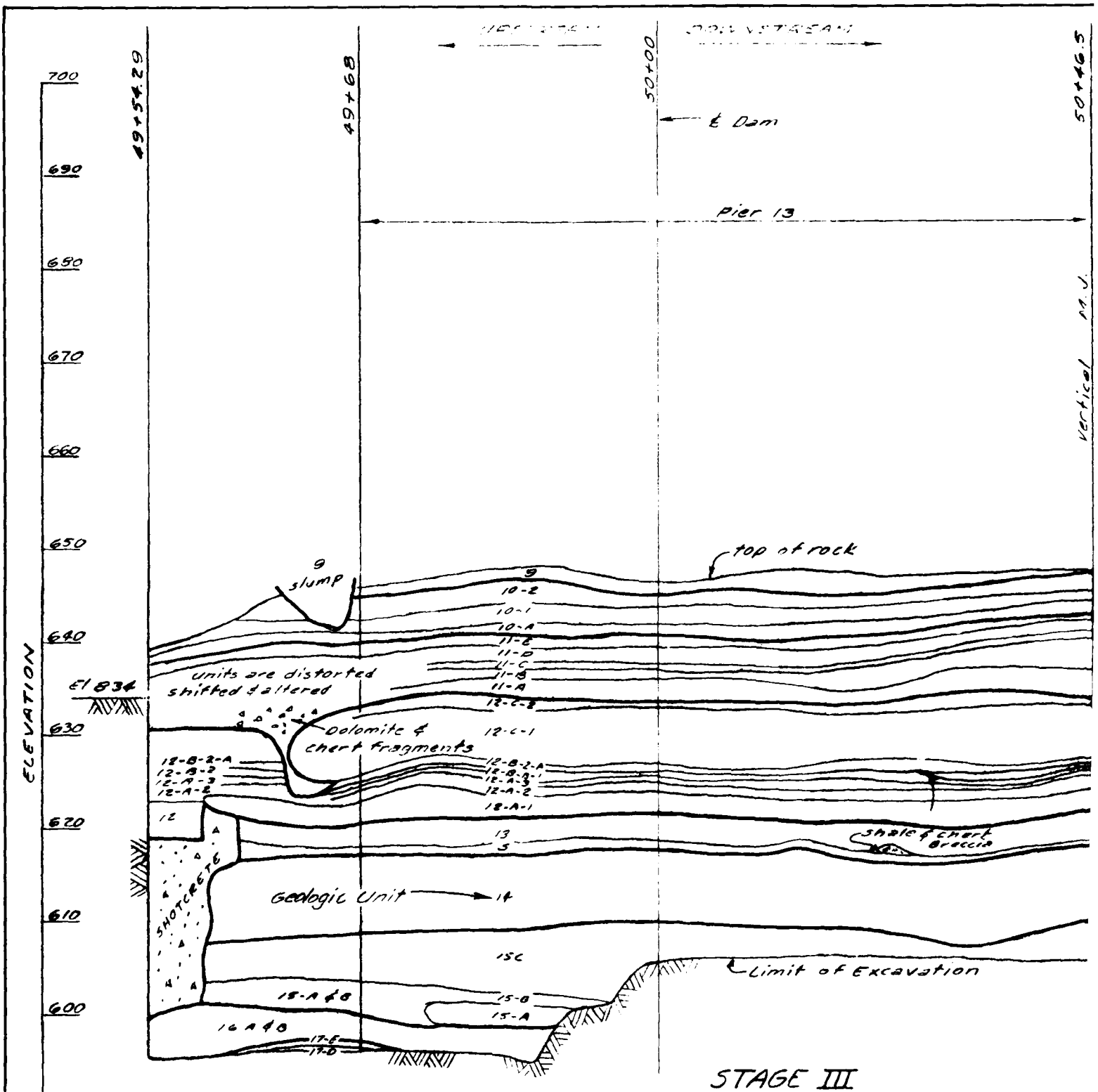
File No. 0-12-9199

PLATE NO. 69

STAGE I CONSTRUCTION

RUCTION

STAGE I CONSTRUCTION



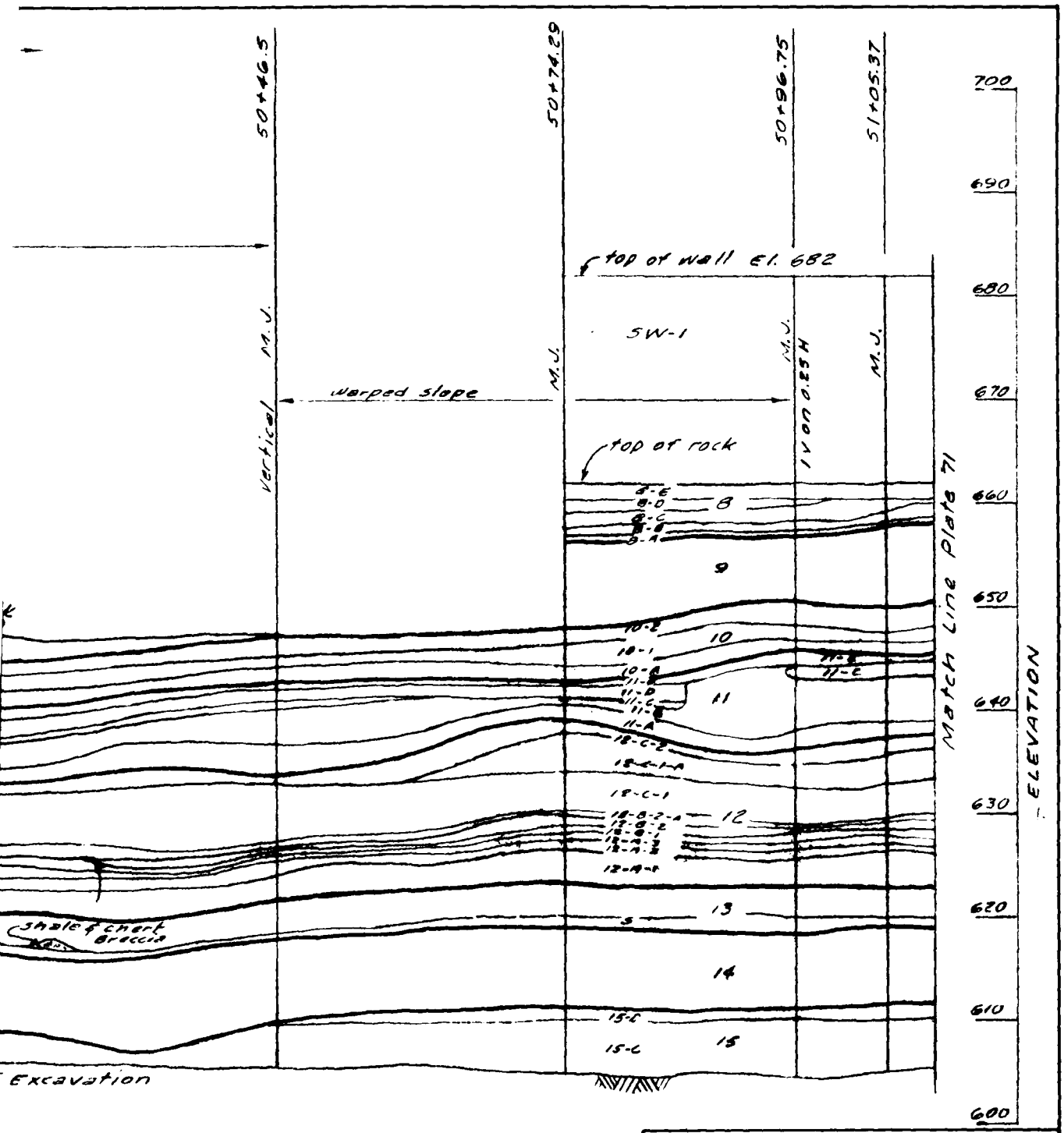
STAGE III

SPILLWAY EXCAVATION LEFT WALL STA 45+54 T

0 10
SCALE IN FEET

ELEVATION AT DAM AXIS STA 46+10
FROM CONTROL LINE "C" RANGE 2+43.75 L

For Legend See Plates 59, 60 & 61



I

L STA 45+54 TO STA 51+10

0 10

ALE IN FEET

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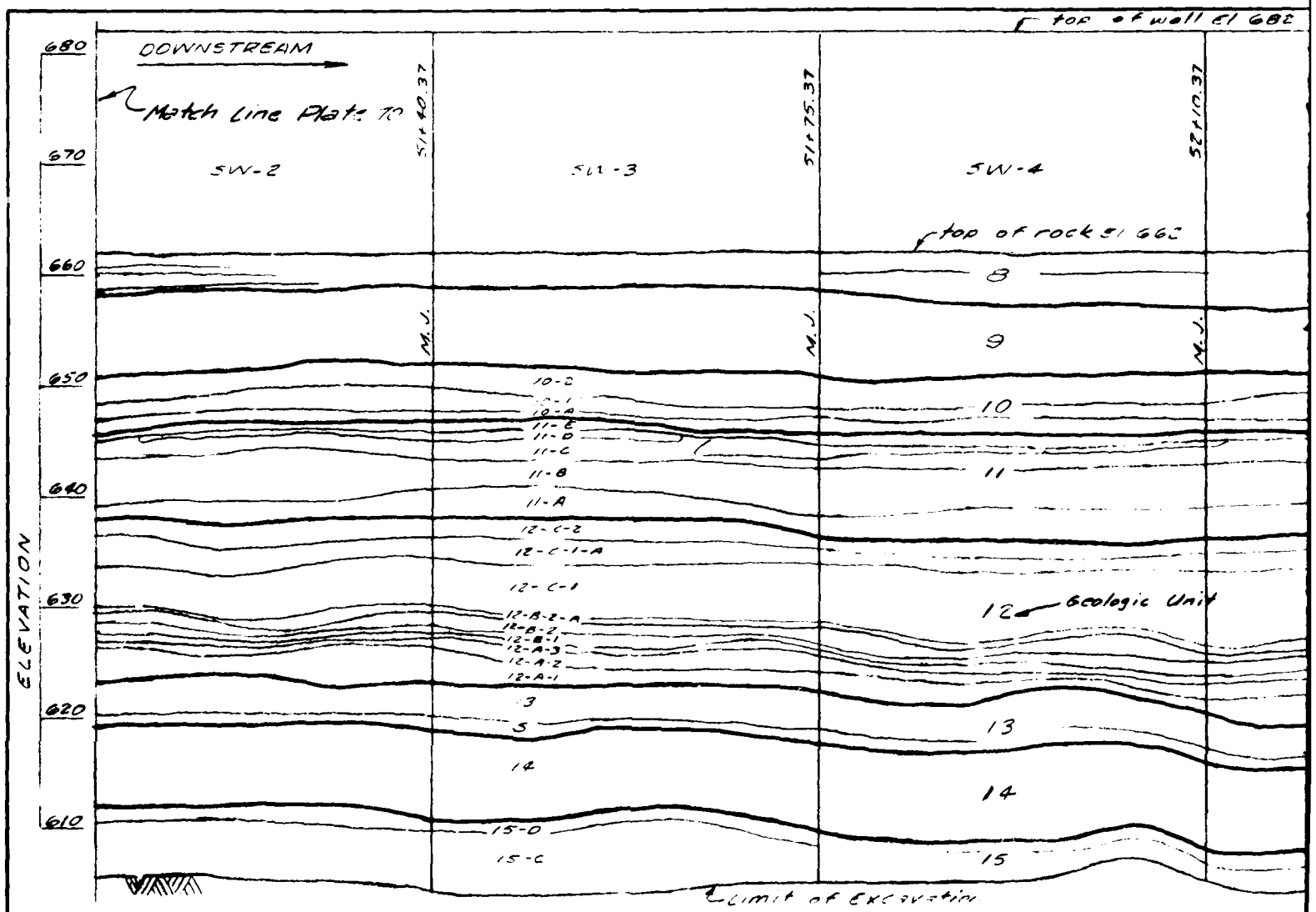
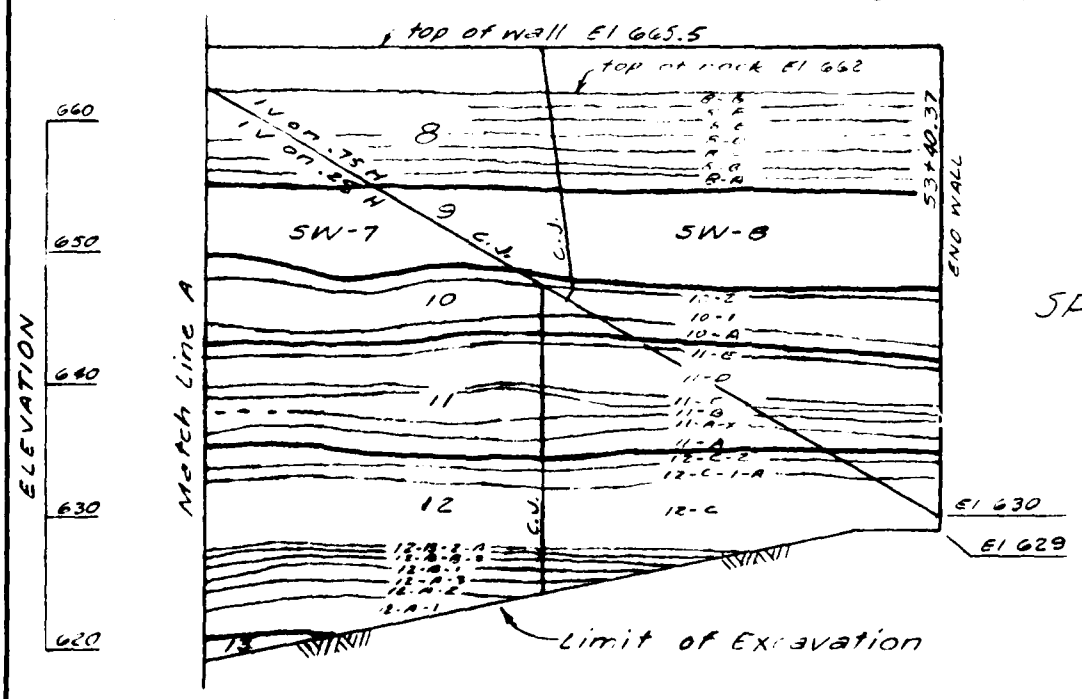
SPILLWAY EXCAVATION
LEFT WALL

Scale:
Date: MARCH 1985
Sheet number:
File No. 0-12-9200

PLATE NO. 70





STAG

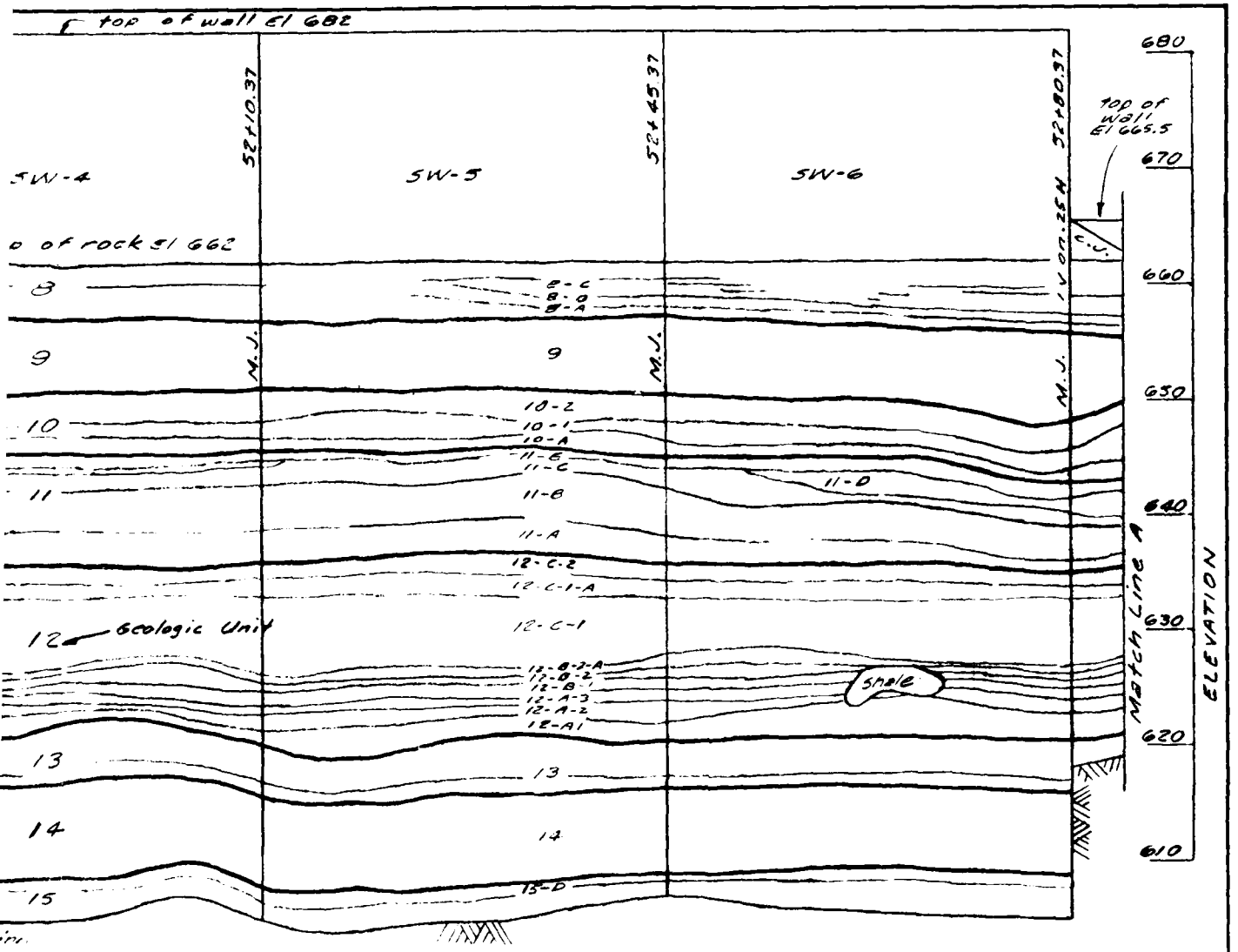
SPILLWAY EXCAVATION

0

SCALE IN

ELEVATION AT DAM
FROM CONTROL LIN

For Legend See Plates 59.



STAGE III

LWAY EXCAVATION LEFT WALL STA 51+10 TO STA 53+40

0 10

SCALE IN FEET

ELEVATION AT DAM AXIS STA 46+10
FROM CONTROL LINE "C" RANGE 2+43.75 L

Legend See Plates 59, 60 & 61

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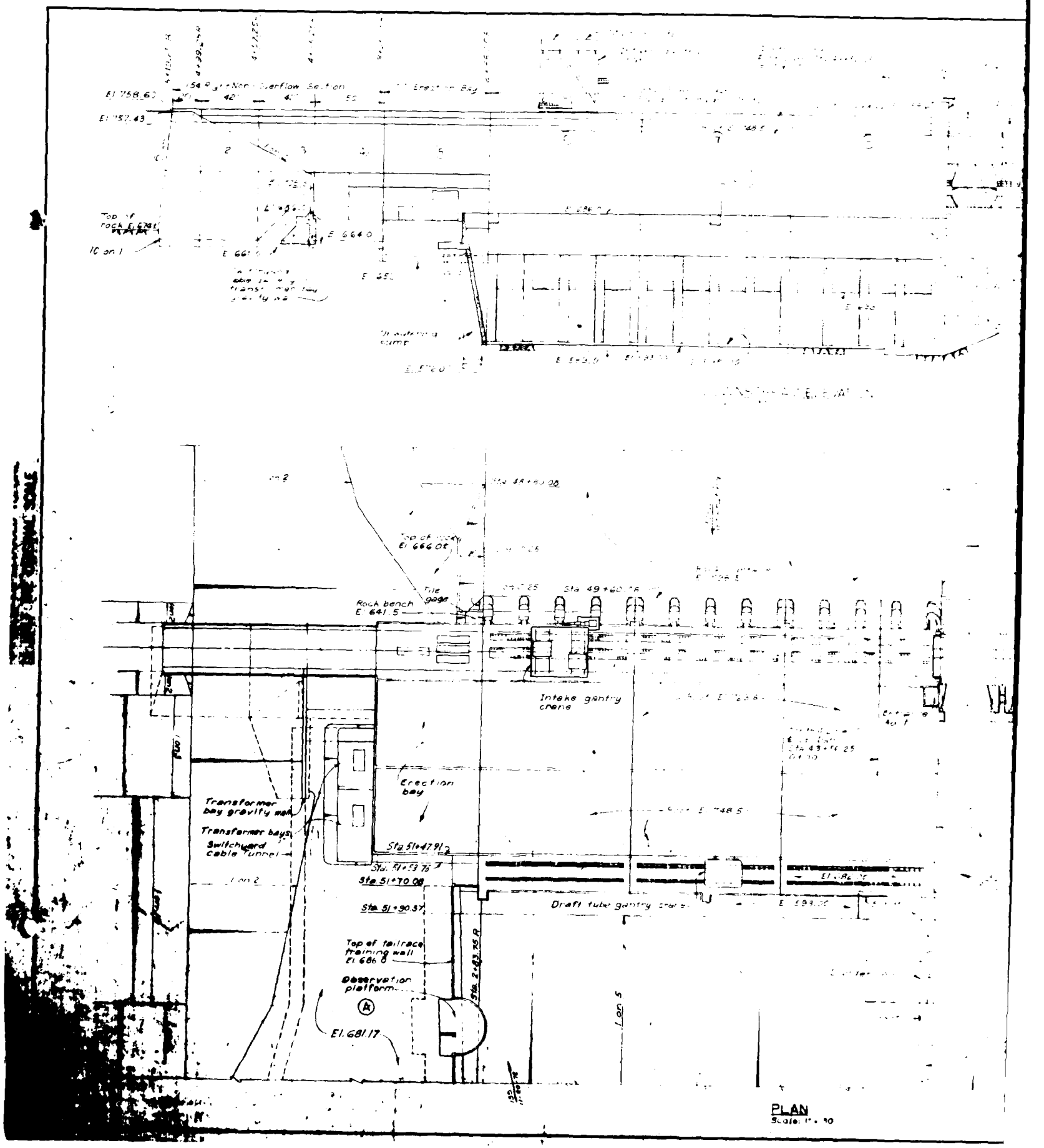
SPILLWAY EXCAVATION
LEFT WALL

Scale
Date: MARCH 1966
Dwg No.
Sheet number
File No. 0-12-9201

PLATE NO. 71


Erection Bay
Top of rock El 666.0±
Tile gage
Rock bench El 641.5
Intake gantry crane
Erection bay
Transformer bay gravity wall
Transformer bays
Switchyard cable tunnel
Sta 51+47.91
Sta 51+70.08
Sta 51+90.37
Draft tube gantry crane
Top of tailrace training wall El 686.0
Observation platform
El. 681.17
Sta 2+03.75 R
Lon 5
Lon 2
PLAN
Scale: 1" = 40

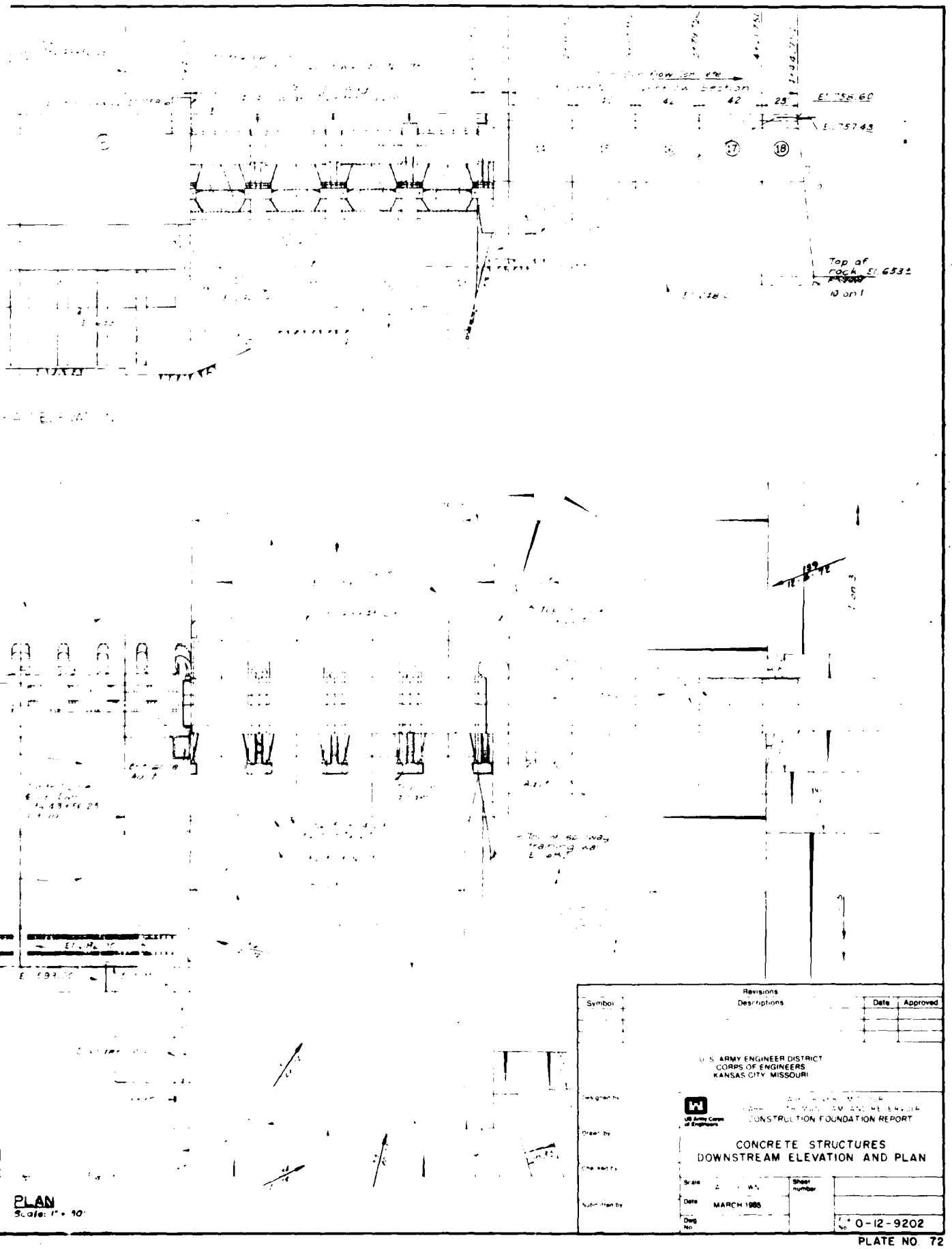
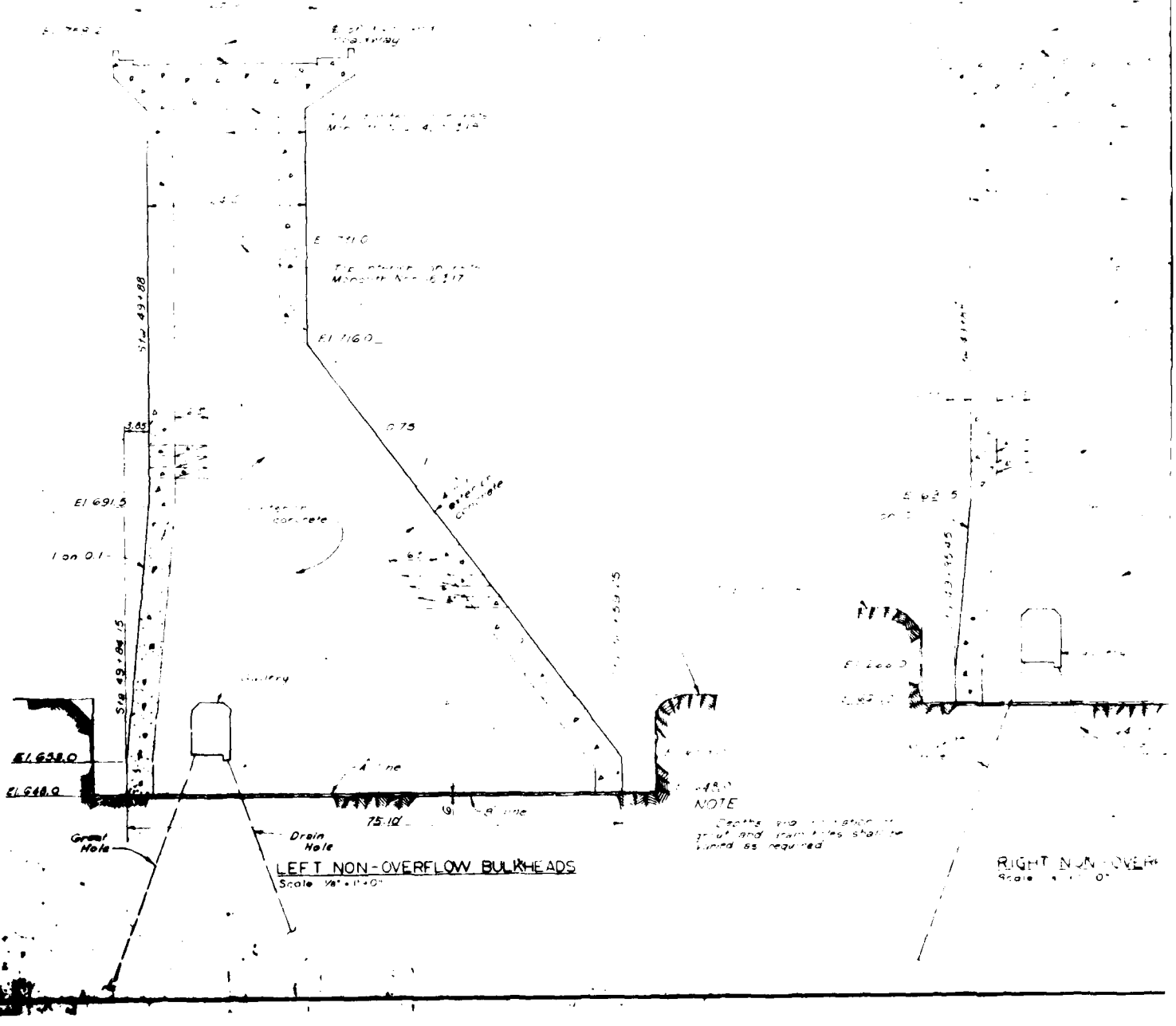
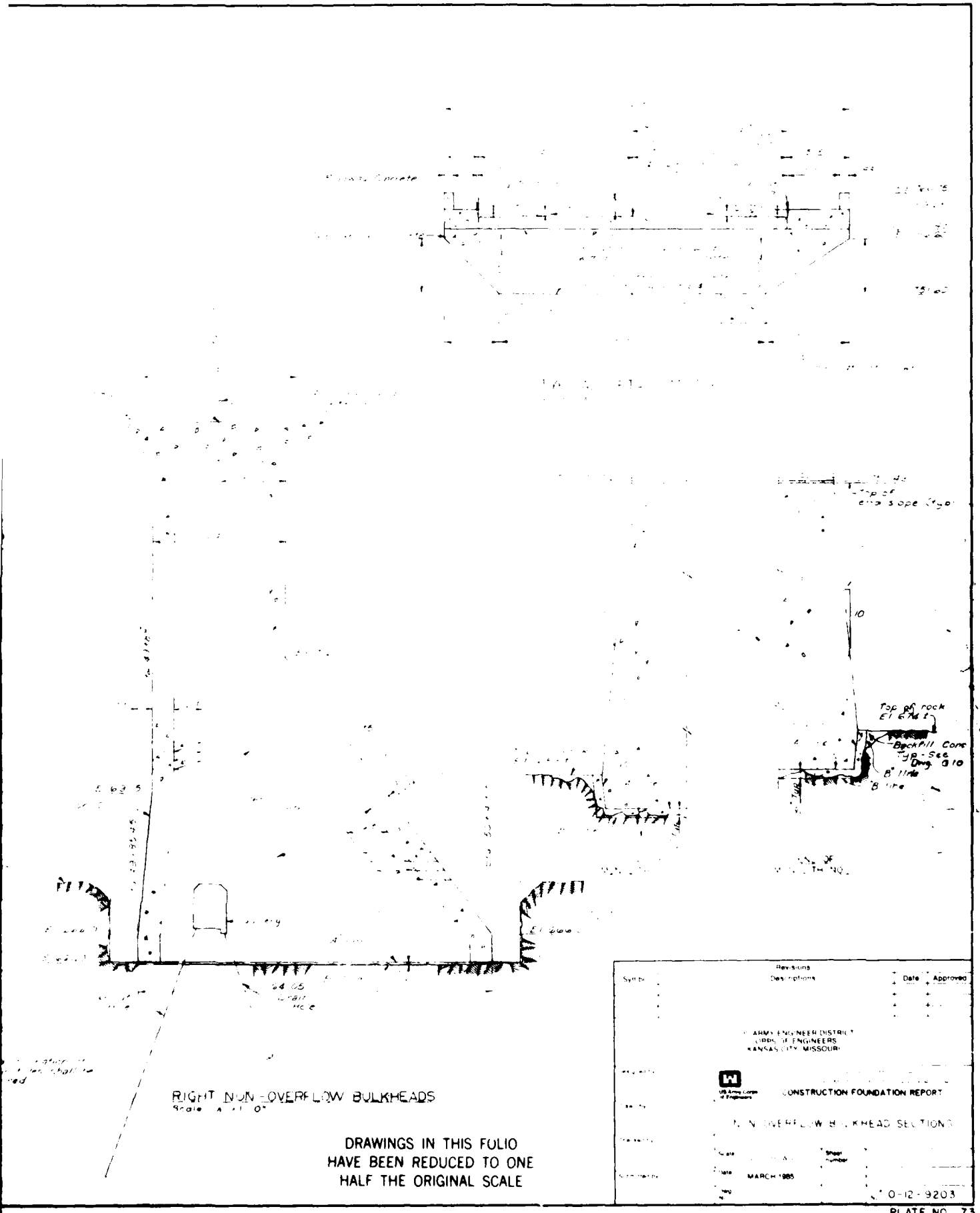
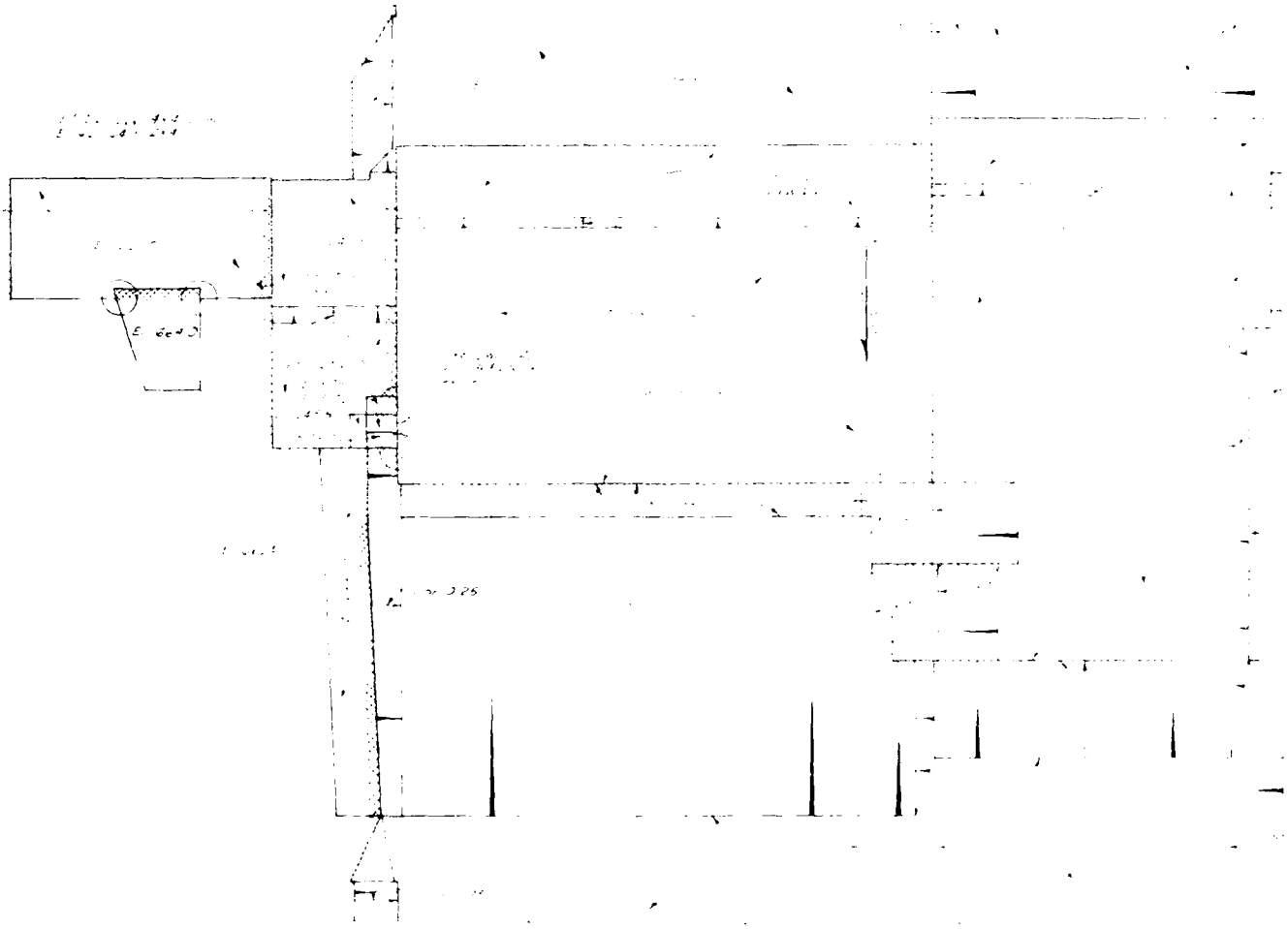

Flow on ex
Section
42
25
El 758.60
El 757.43
17
18
Top of rock El 653±
10 on 1
PLAN
Scale: 1" = 10'
Revisions
Symbol
Descriptions
Date
Approved
U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY MISSOURI
US Army Corps of Engineers
CONSTRUCTION FOUNDATION REPORT
CONCRETE STRUCTURES
DOWNSTREAM ELEVATION AND PLAN
Designed by
Drawn by
Checked by
Submitted by
Scale
Date
MARCH 1985
Sheet number
Dwg No
No. 0-12-9202

PLATE NO. 72

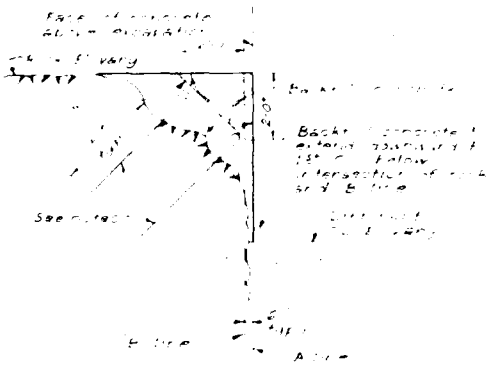

El 691.5
1 on 0.1
El 658.0
El 648.0
Grout Hole
Drain Hole
75.10'
NOTE
LEFT NON-OVERFLOW BULKHEADS
RIGHT NON-OVER



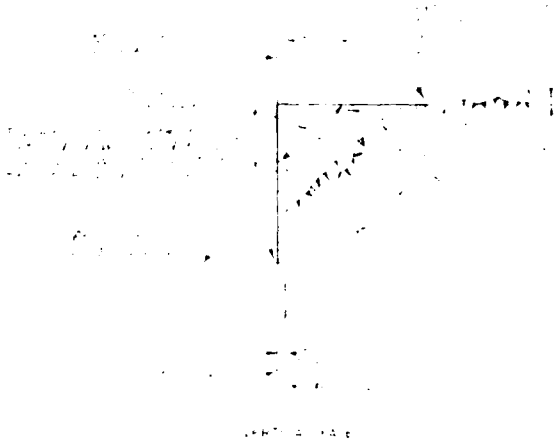
DRAWINGS IN THIS FOLIO
HAVE BEEN REDUCED TO ONE
HALF THE ORIGINAL SCALE



PLAN OF ROCK EXCAVATION

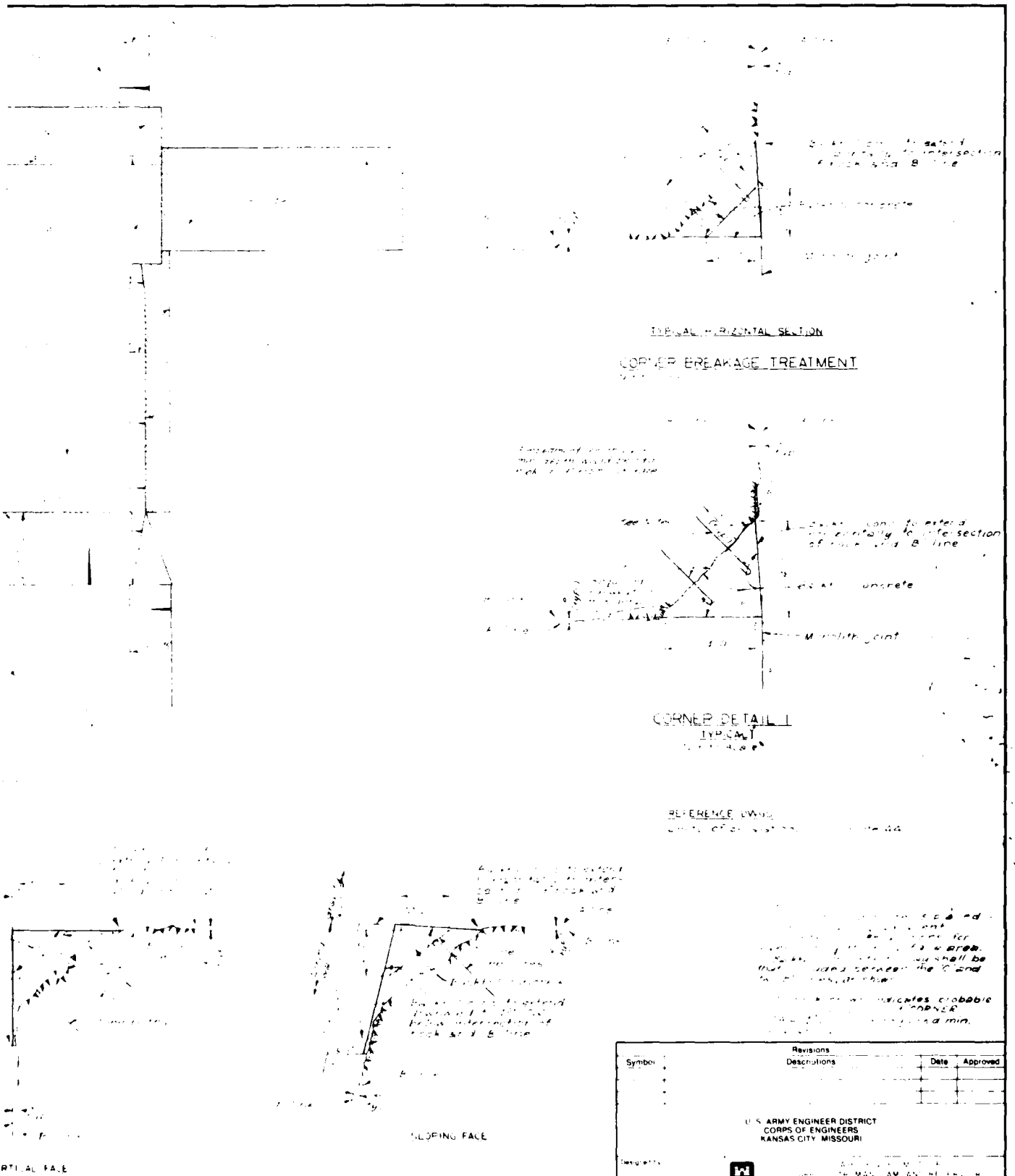


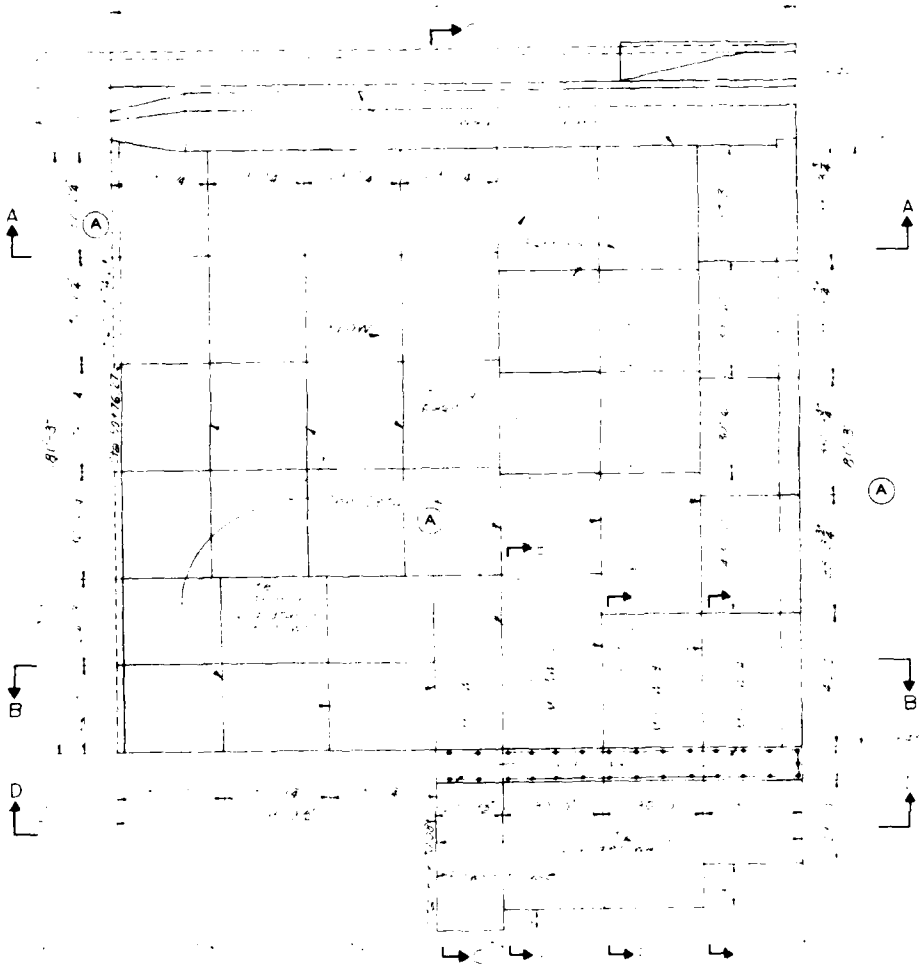
TYPICAL VERTICAL EXTERIOR SECTION



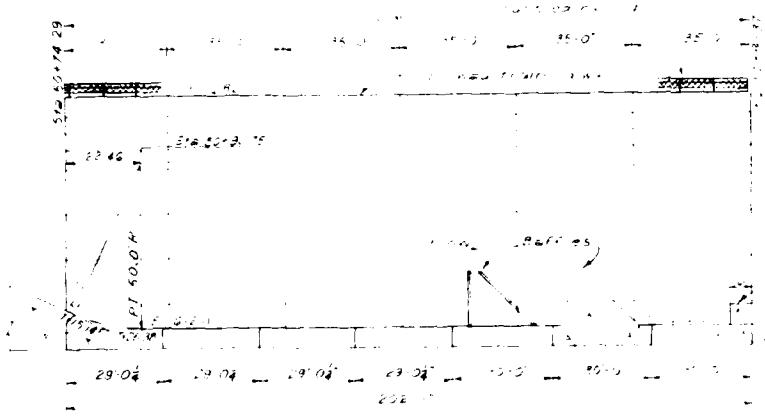
TYPICAL VERTICAL

EDGE BREAKAGE TREATMENT

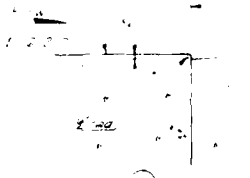

TYPICAL HORIZONTAL SECTION
CORNER BREAKAGE TREATMENT
CORNER DETAIL I
TYPICAL
REFERENCE
SLOPING FACE
TYPICAL VERTICAL INTERSECTIONS
AGE TREATMENT
DRAWINGS IN THIS FOLIO
HAVE BEEN REDUCED TO ONE
HALF THE ORIGINAL SCALE
Revisions
Symbol
Descriptions
Date
Approved
U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI
US Army Corps of Engineers
ONSTRUCTION FOUNDATION REPORT
BACKFILL CONCRETE DETAILS
Scale
Date
MARCH 1985
Sheet number
No 0-12-9204



PLAN

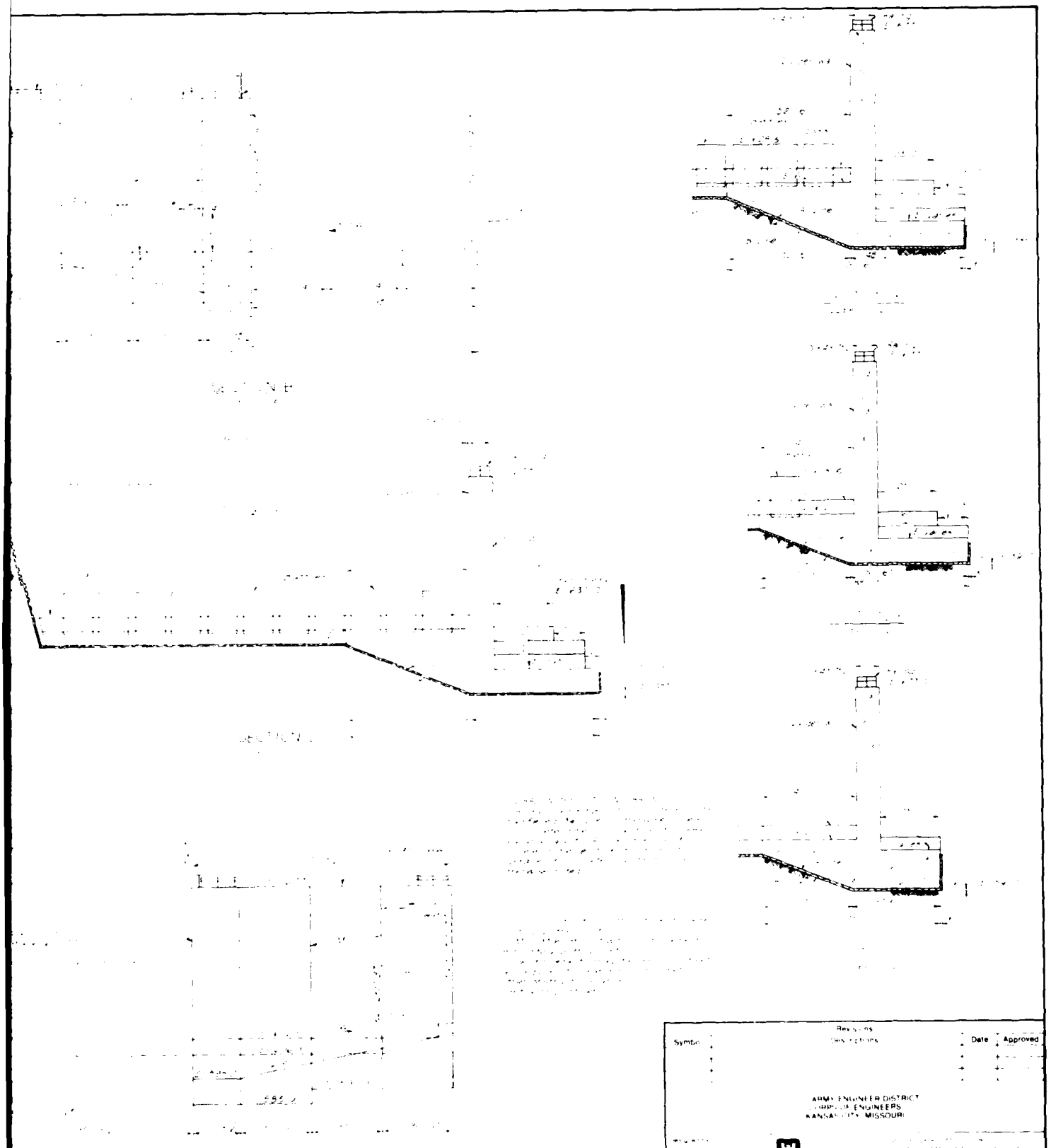


SECTION A



A DETAIL 1

SECTION 2



Revisions
Symbol | Description | Date | Approved

ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

US Army Corps of Engineers

CONSTRUCTION FOUNDATION REPORT

STILLING BASIN
GENERAL LAYOUT

Scale
Date MARCH 1985
Drawing No.
Sheet number
0-12-9205

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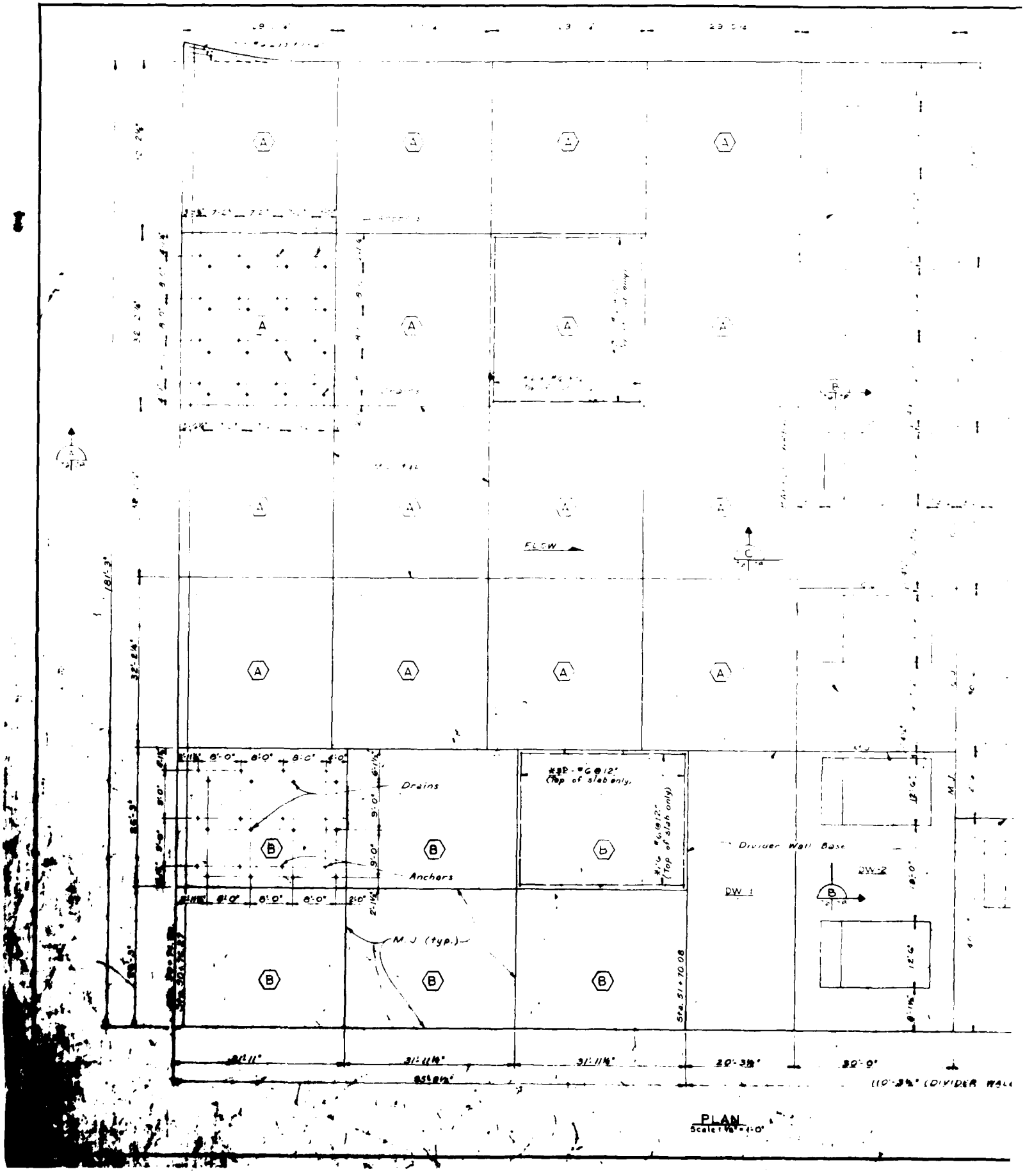
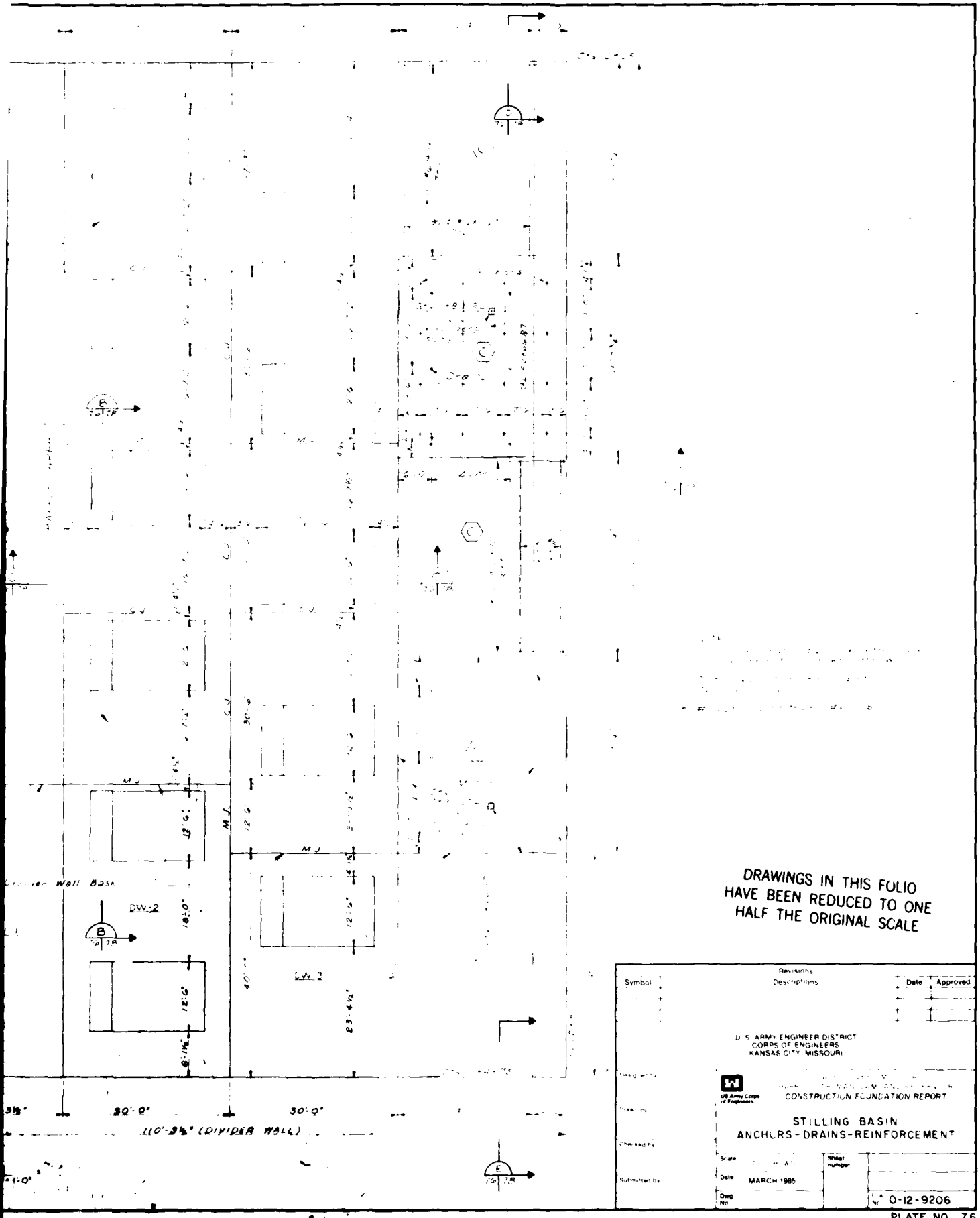
HALF THE ORIGINAL SCALE

PLATE NO 75


FLOW
Drains
Anchors
M.J. (typ.)
Divider Wall Base
DW-1
DW-2
PLAN
Scale 1/8" = 1'-0"



DRAWINGS IN THIS FOLIO HAVE BEEN REDUCED TO ONE HALF THE ORIGINAL SCALE

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U. S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

US Army Corps of Engineers

CONSTRUCTION FOUNDATION REPORT

STILLING BASIN
ANCHORS - DRAINS - REINFORCEMENT

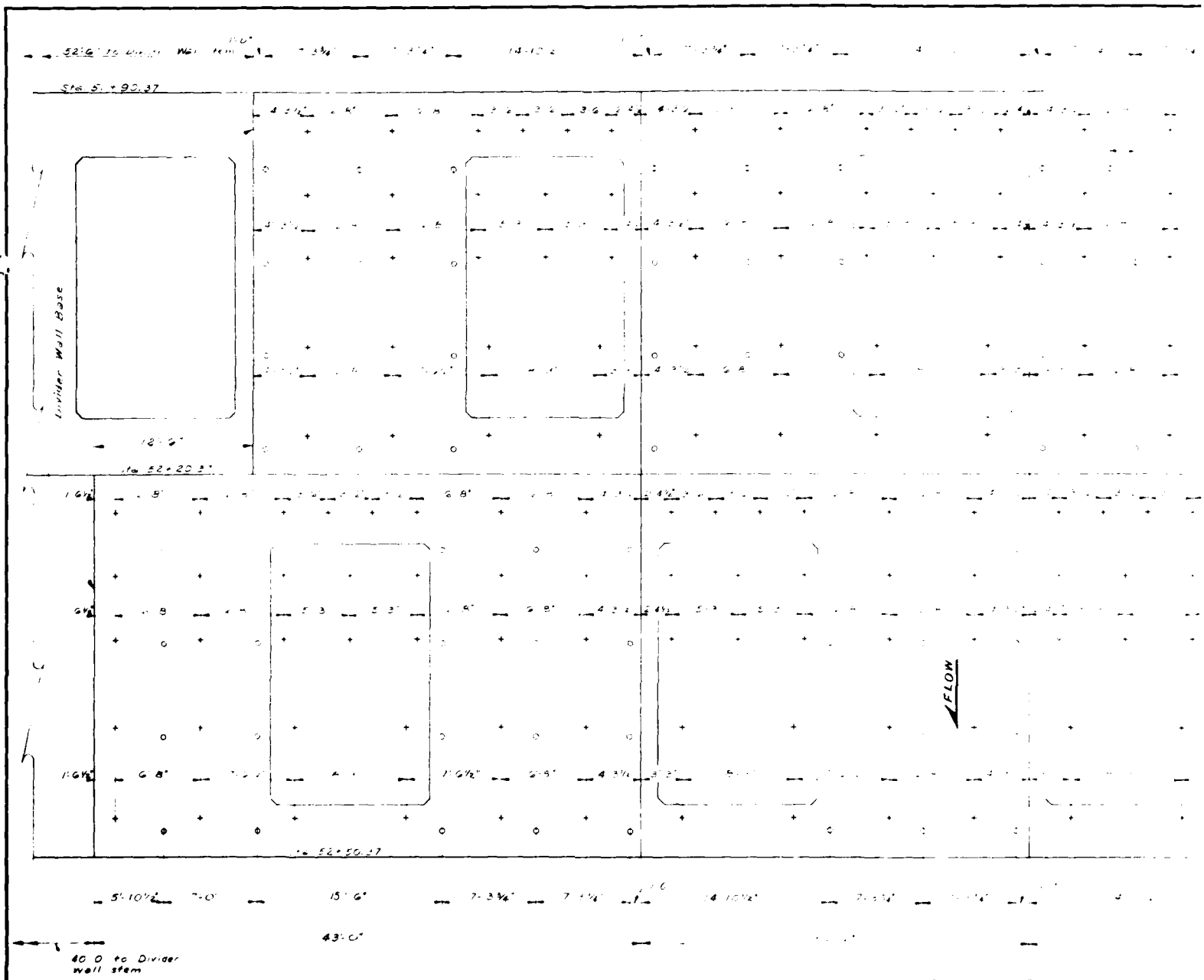
Scale

Date MARCH 1985

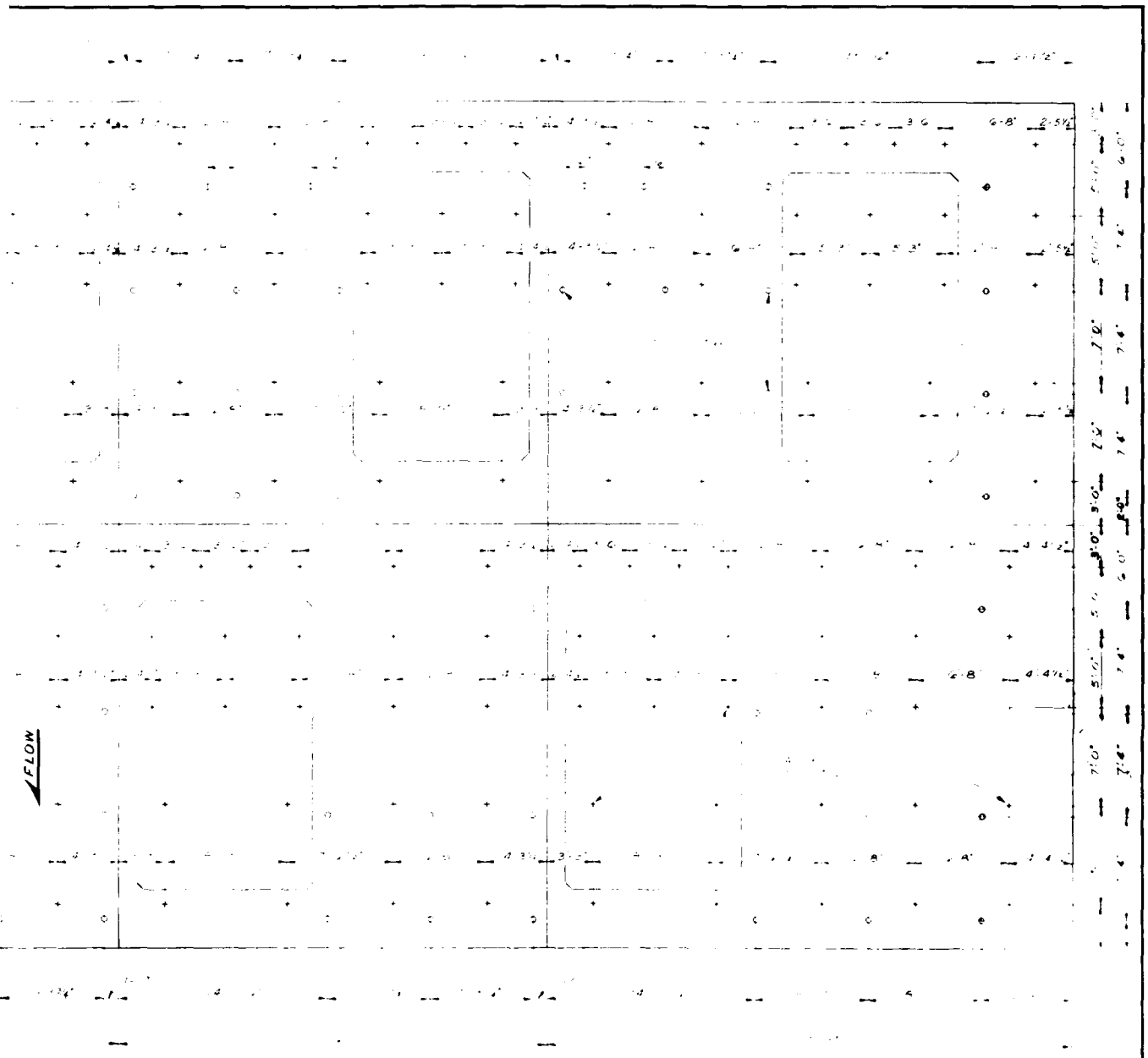
Dwg No. 0-12-9206

Sheet number

PLATE NO 76



PLAN - BAFFLE AREA



PLAN - BAFFLE AREA

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HAVE BEEN REDUCED TO ONE
HALF THE ORIGINAL SCALE

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CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

US Army Corps of Engineers

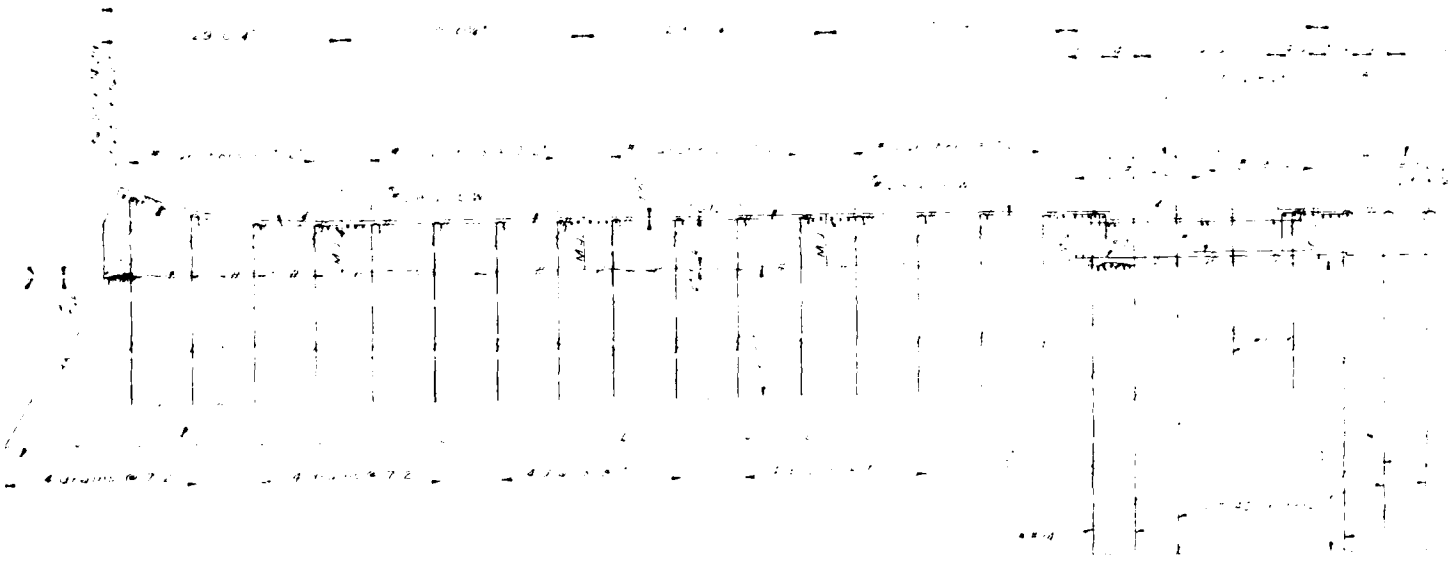
CONSTRUCTION FOUNDATION REPORT

STILLING BASIN
BAFFLE AREA-ANCHORS AND DRAINS

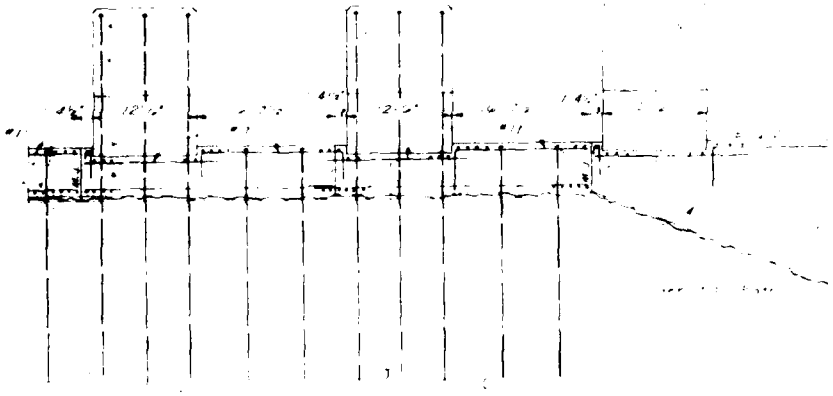
Scale
Date MARCH 1985
Drawing No.
Sheet number
Submitted by

0-12-9207

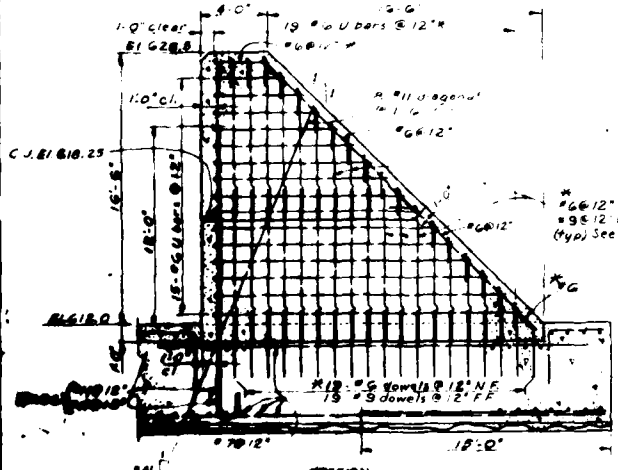
PLATE NO 77



SECTION A

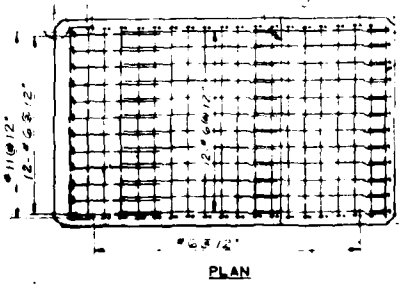


SECTION B



SECTION

Note:
All baffle reinf
6" clear except as
shown otherwise.



PLAN

SLAB DRAIN

BAFFLE DETAILS

Scale: "A" = 1'-0"

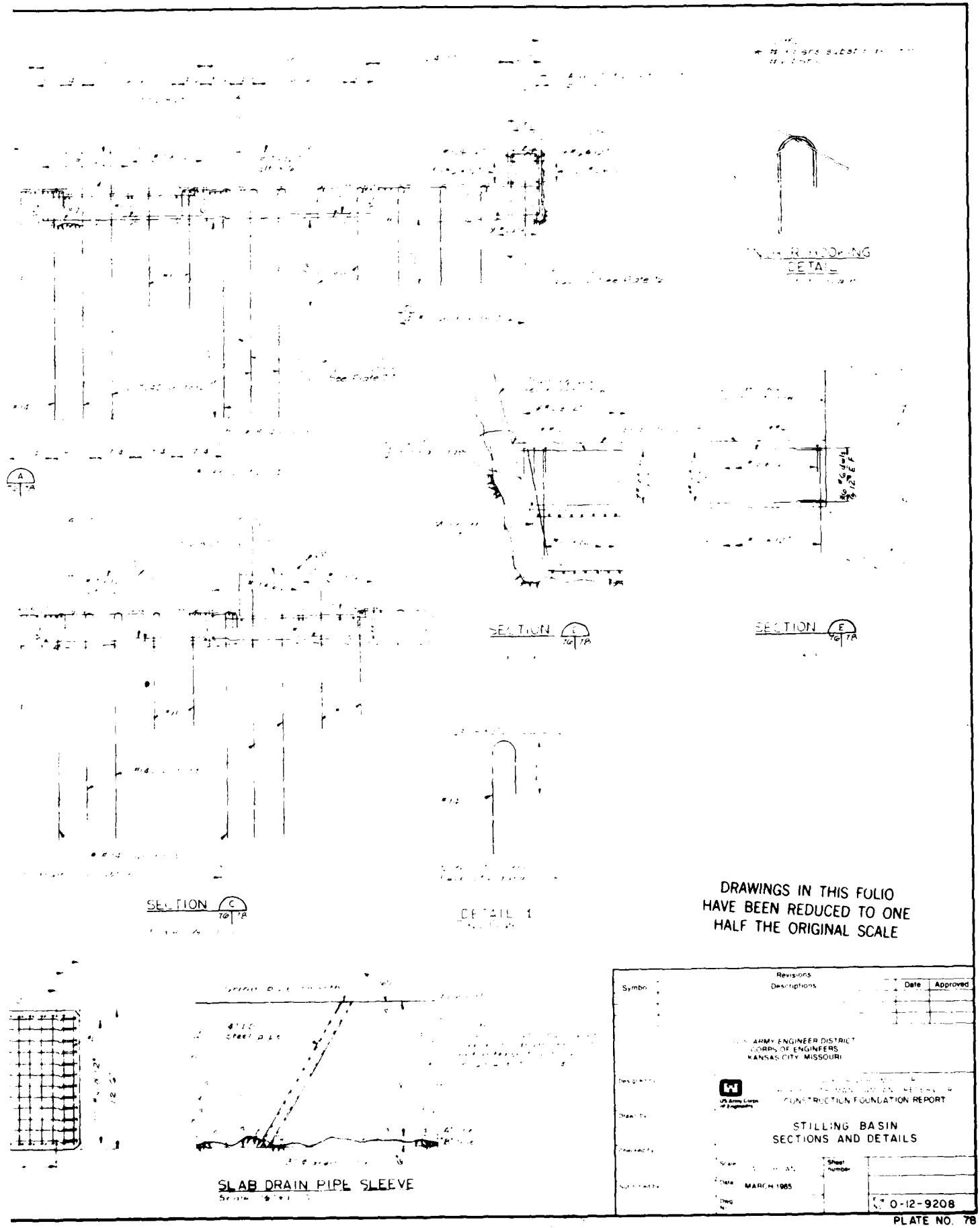
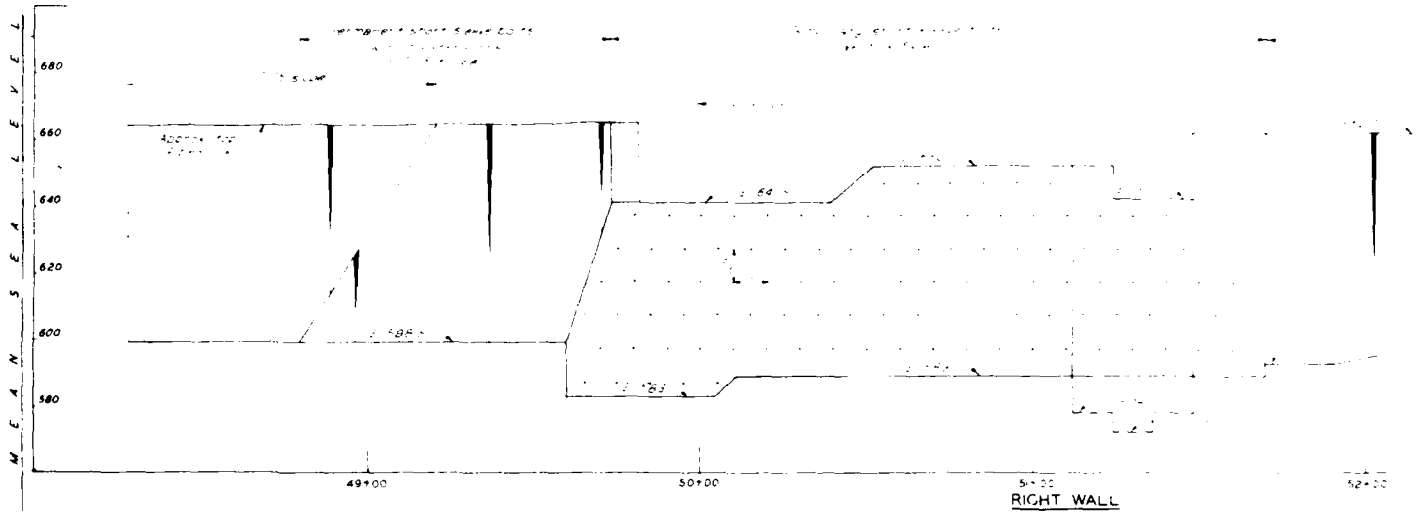
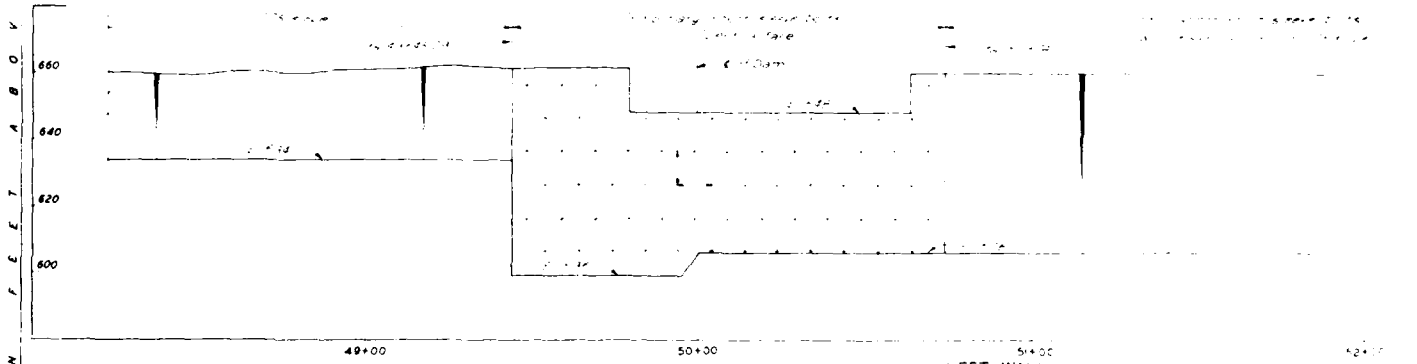

DETAIL
SECTION
SECTION
SECTION
DETAIL 1
DRAWINGS IN THIS FOLIO
HAVE BEEN REDUCED TO ONE
HALF THE ORIGINAL SCALE
SLAB DRAIN PIPE SLEEVE
Revisions
Descriptions
Date
Approved
ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI
CONSTRUCTION FOUNDATION REPORT
STILLING BASIN
SECTIONS AND DETAILS
MARCH 1985
0-12-9208

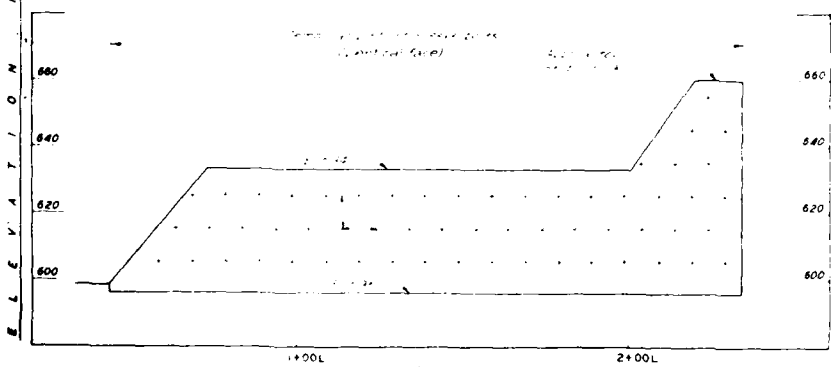
PLATE NO. 78



RIGHT WALL

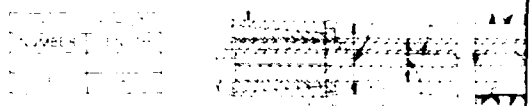


LEFT WALL

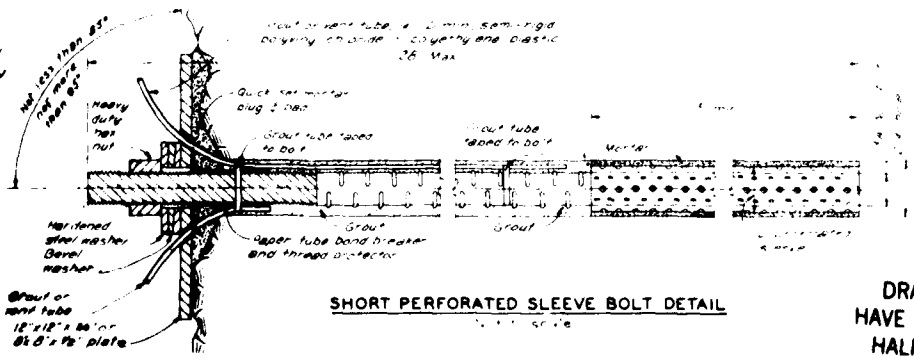


WALL - STA. 49 + 45.29

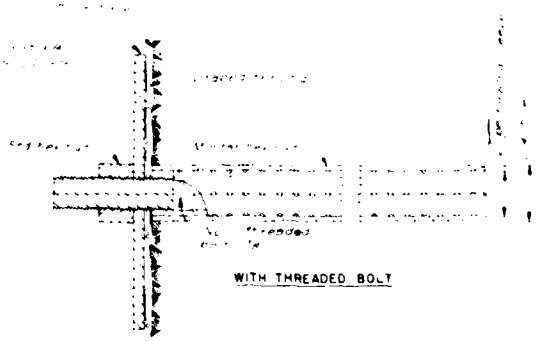
LOOKING UPSTREAM



ROCK DEFORMETER BOLT DETAIL



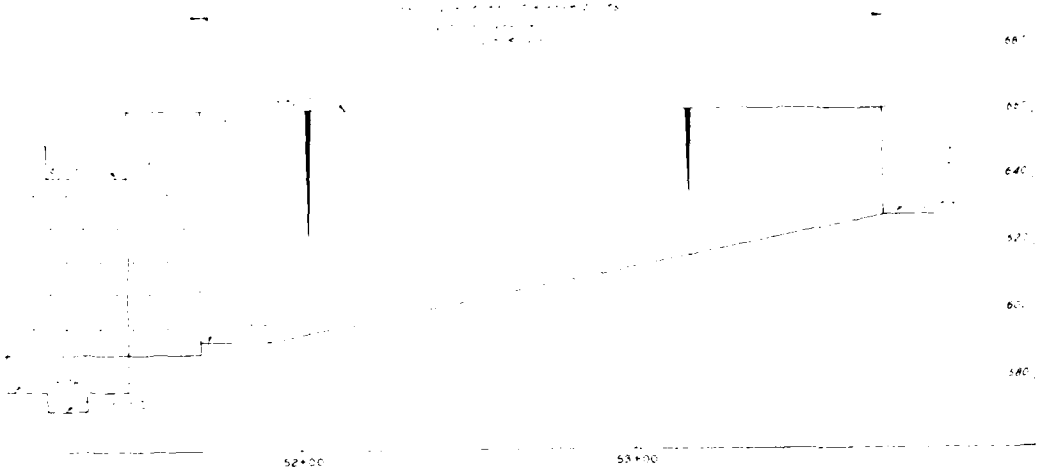
SHORT PERFORATED SLEEVE BOLT DETAIL



WITH THREADED BOLT

FULL PERFORATED SLEEVE BOLT

DRAWINGS IN THIS FOLIO HAVE BEEN REDUCED TO ONE HALF THE ORIGINAL SCALE



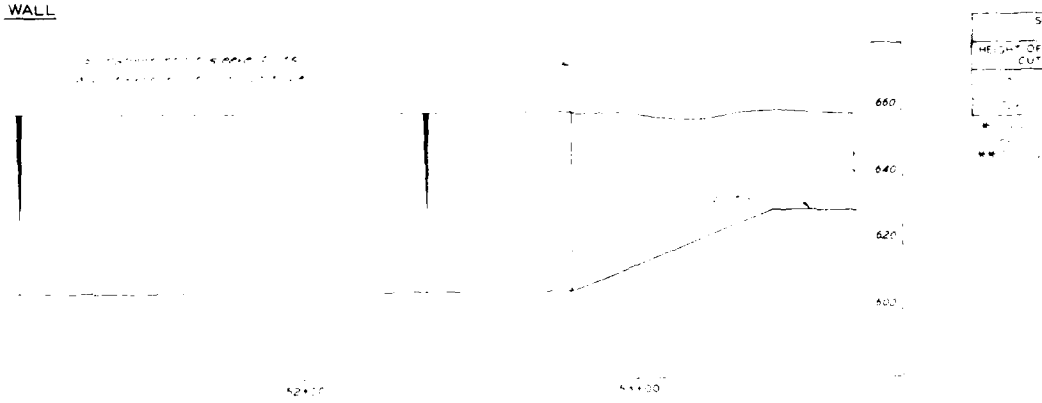
WALL

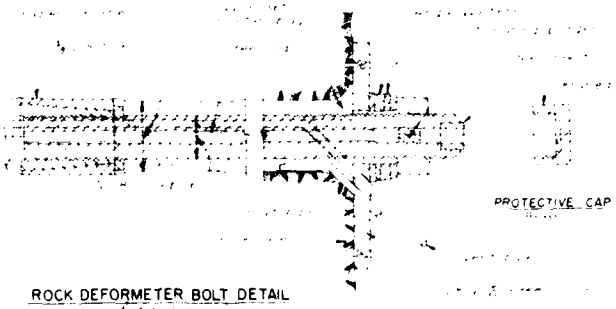
SCHEDULE FOR SPECIAL SURFACES
TEMPORARY BOLTS

HEIGHT OF ROCK CUT	LENGTH *	GENERAL SPACING **
[illegible]	[illegible]	[illegible]

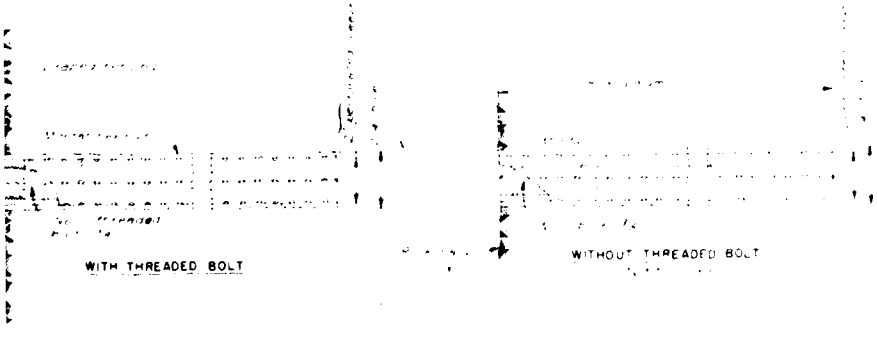
* [illegible]

** [illegible]





ROCK DEFORMETER BOLT DETAIL



FULL PERFORATED SLEEVE BOLT DETAIL

OLIO
O ONE
CALE

Symbol	Revisions Description	Date	Approved

ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

US Army Corps of Engineers

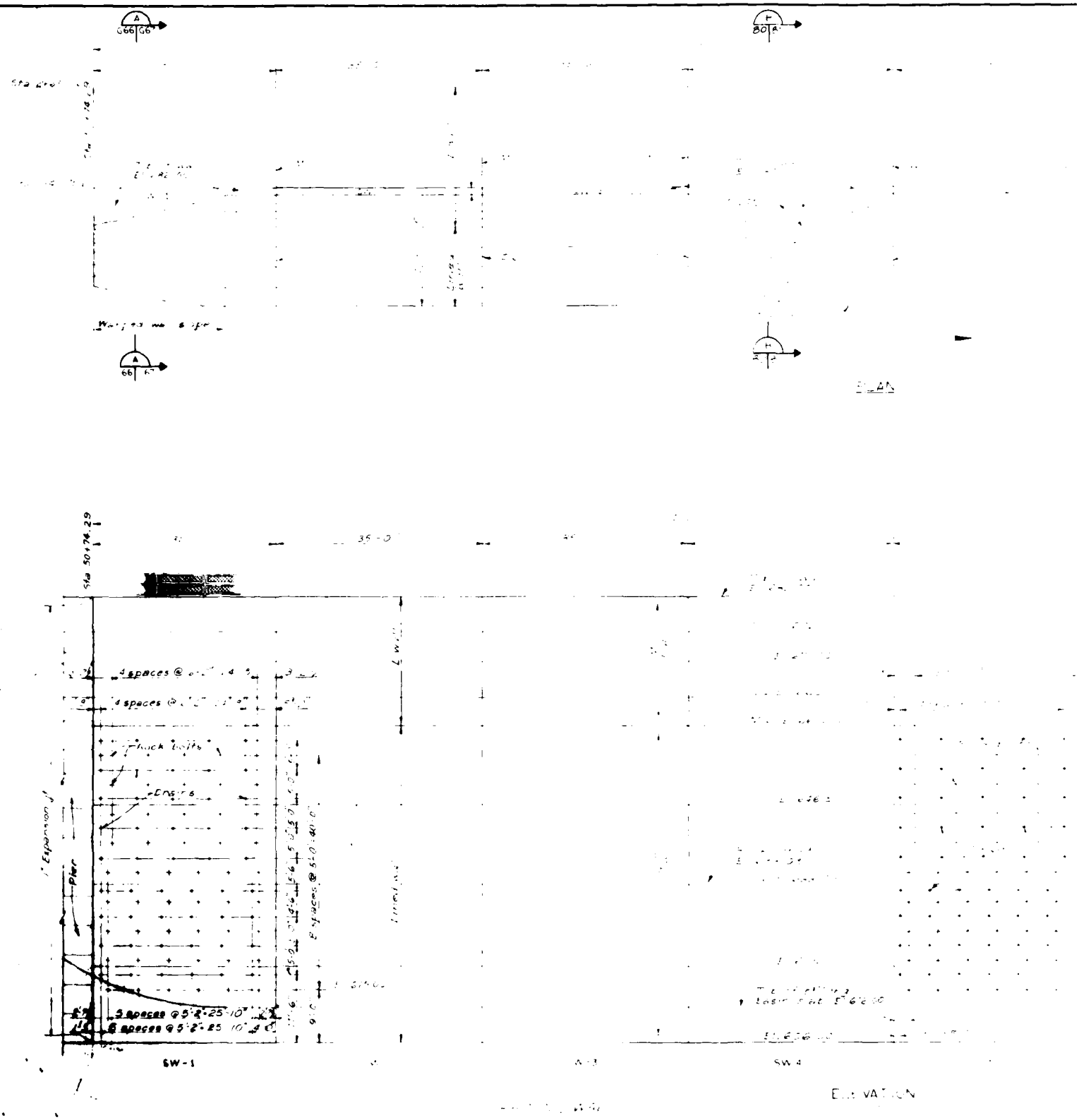
CONSTRUCTION FOUNDATION REPORT

SPILLWAY-POWERHOUSE EXCAVATION
ROCK BOLTING

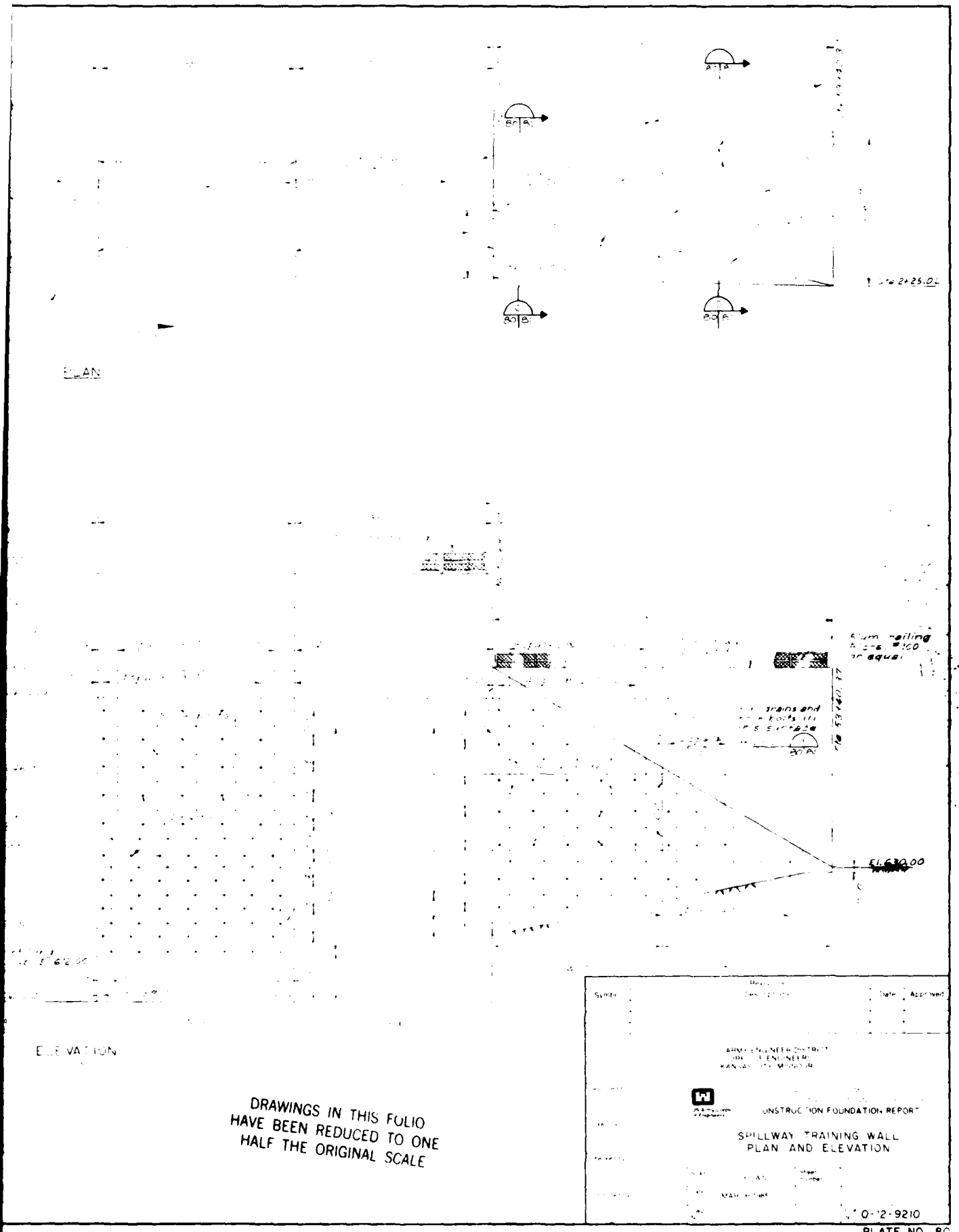
Sheet number

Dwg No. 0-12-9209

PLATE NO 79


Sta 50+74.29
35'-0"
4 spaces @
4 spaces @
Shock Mounts
Dowels
Expansion
Pier
8 spaces @ 5'-0"-40'-0"
5 spaces @ 5'-2"-25'-10"
6 spaces @ 5'-2"-25'-10"
SW-1
SW-4
ELEVATION

DR
HAVE
HAL



DRAWINGS IN THIS FOLIO HAVE BEEN REDUCED TO ONE HALF THE ORIGINAL SCALE

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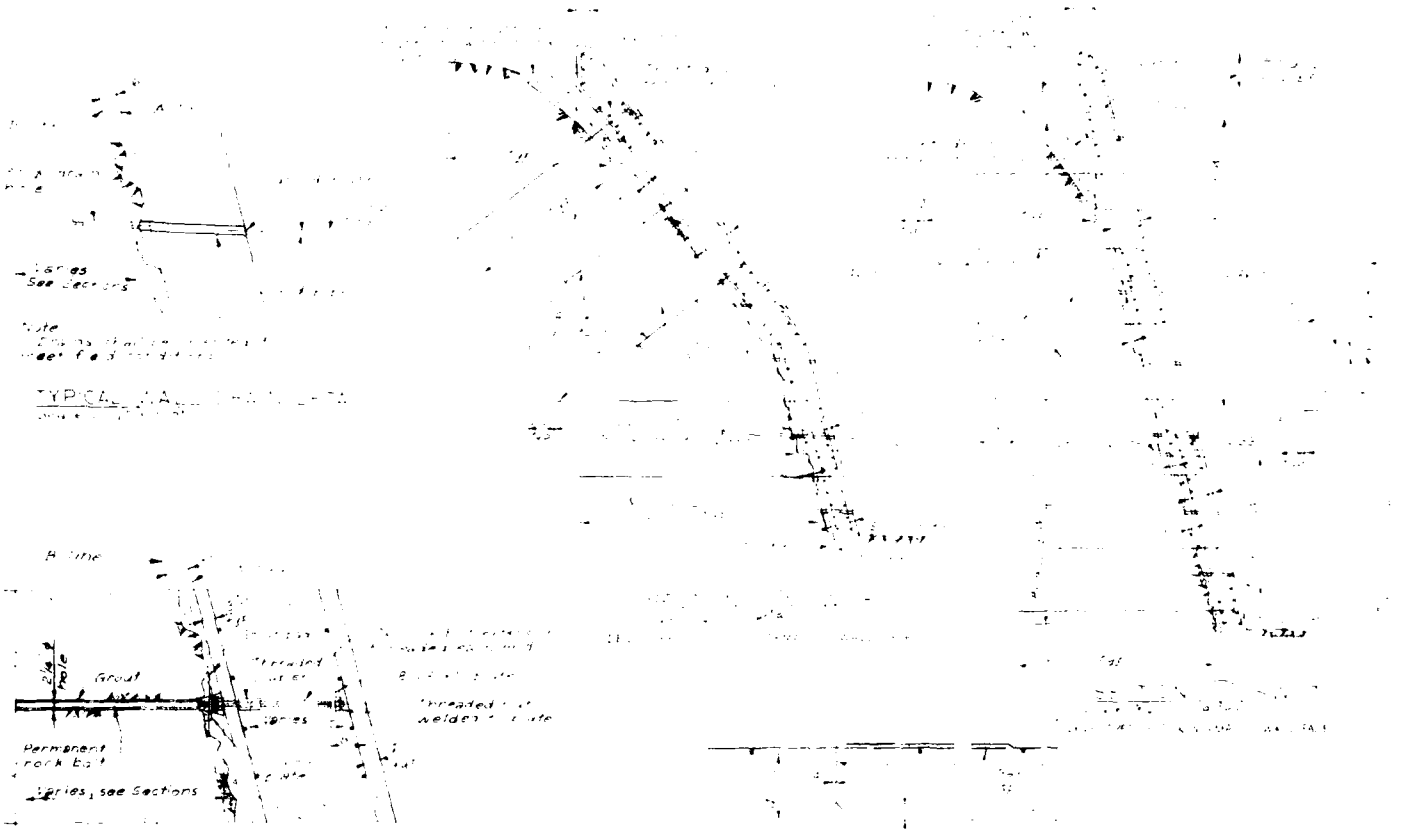
ARMY ENGINEER DISTRICT
DIST. ENGINEER
KANSAS CITY, MISSOURI

UNSTRUCTION FOUNDATION REPORT

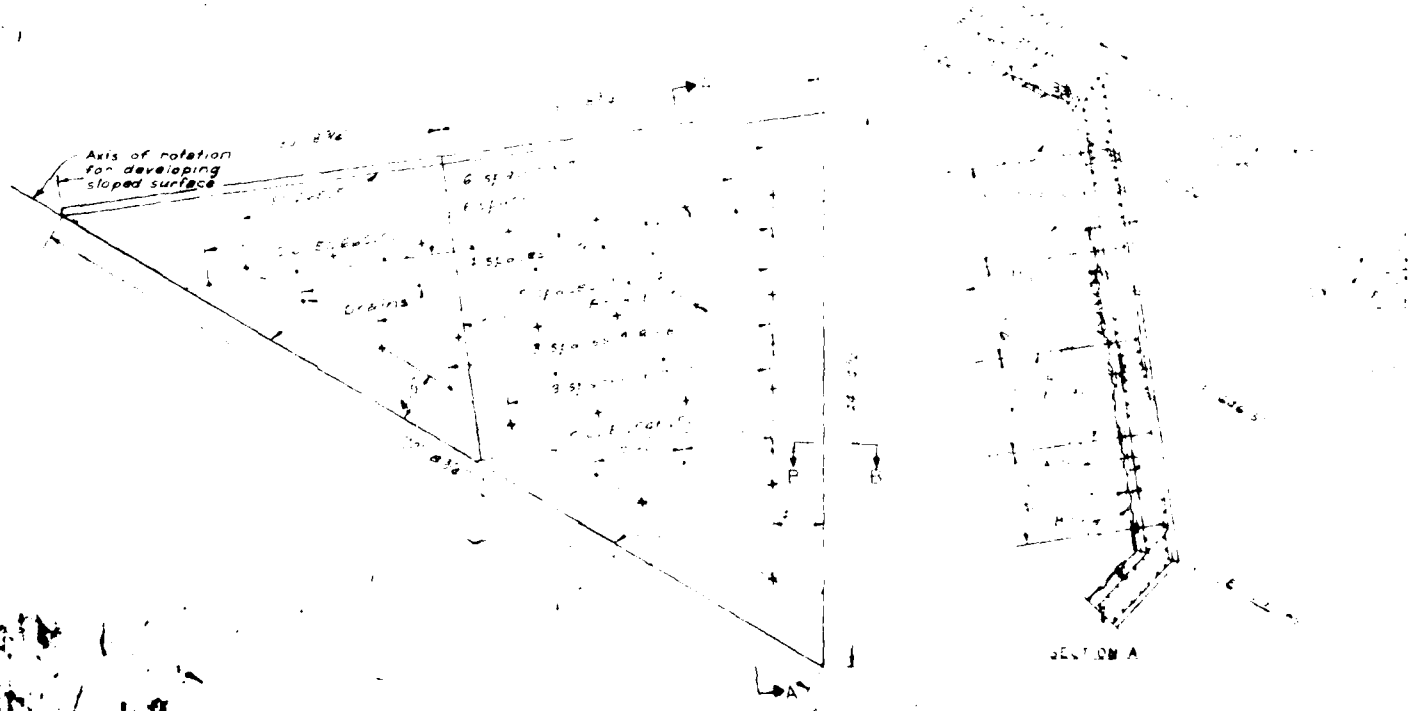
SPILLWAY TRAINING WALL
PLAN AND ELEVATION

0-12-9210

PLATE NO. 80



TYPICAL WALL & ROCK BOLT EXTENSION



DETAIL 1 DEVELOPED VIEW

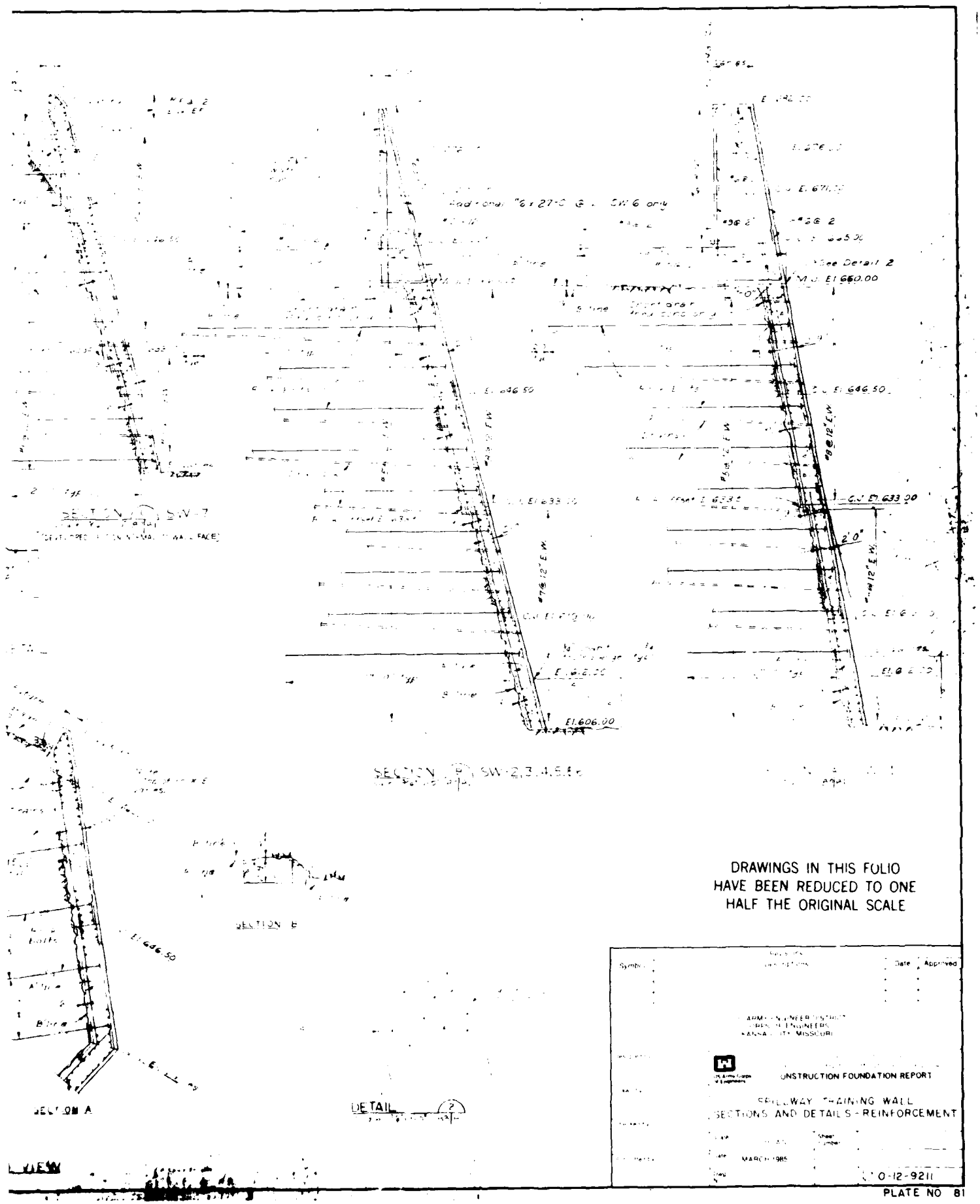
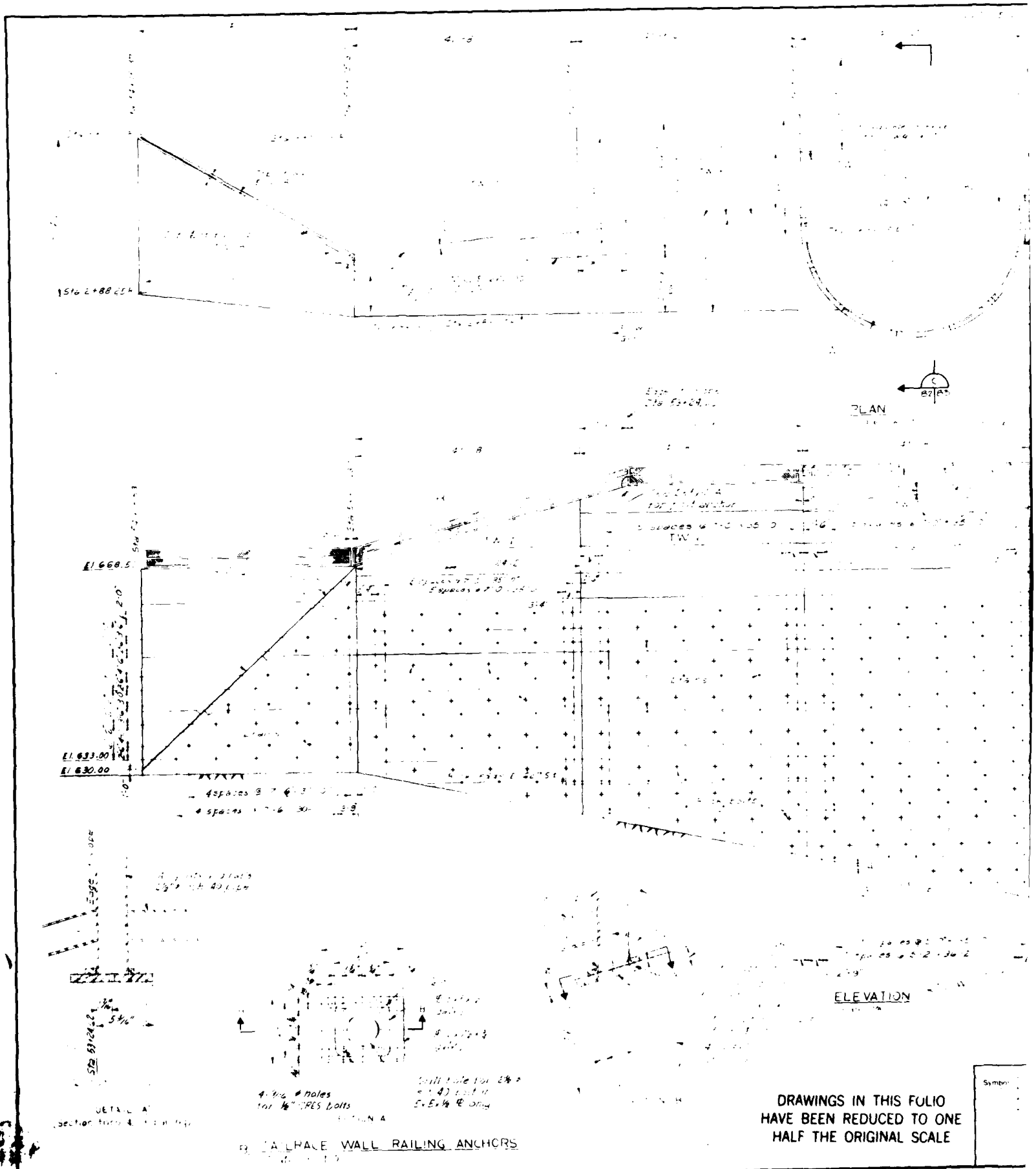
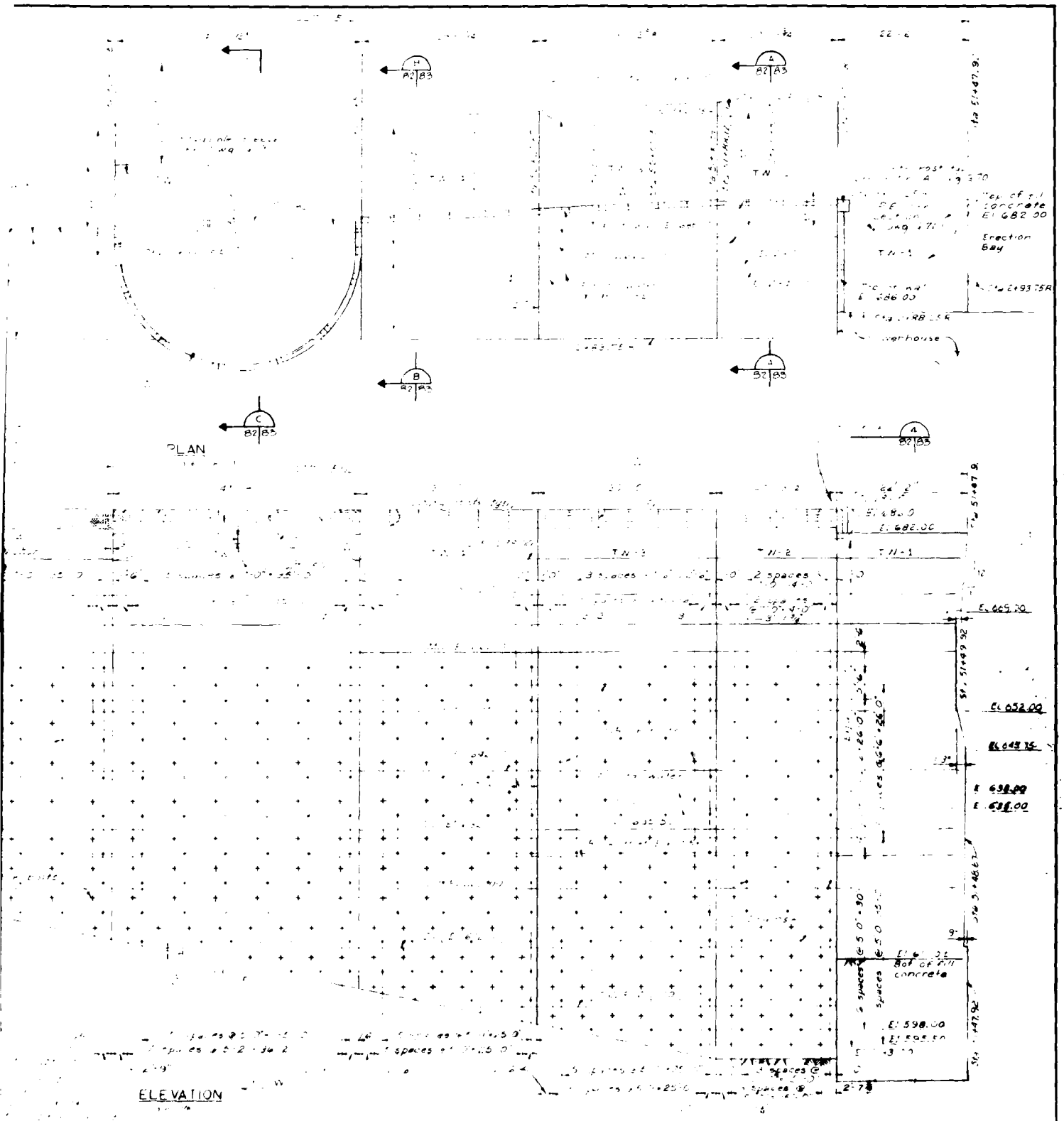

Additional #6 x 27'-0" @ 6" SW 6 only
See Detail 2
E.L. 660.00
E.L. 646.50
E.L. 633.00
E.L. 606.00
2'-0"
SECTION SW-7
SECTION SW-2,3,4,5,6
SECTION B
SECTION A
DETAIL 2
DRAWINGS IN THIS FOLIO
HAVE BEEN REDUCED TO ONE
HALF THE ORIGINAL SCALE
Symbol
Date
Approved
CONSTRUCTION FOUNDATION REPORT
SPILLWAY TRAINING WALL
SECTIONS AND DETAILS - REINFORCEMENT
MARCH 1985
0-12-9211

PLATE NO. 81



DRAWINGS IN THIS FOLIO HAVE BEEN REDUCED TO ONE HALF THE ORIGINAL SCALE



DRAWINGS IN THIS FOLIO HAVE BEEN REDUCED TO ONE HALF THE ORIGINAL SCALE

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U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

US Army Corps of Engineers

CONSTRUCTION FOUNDATION REPORT

TAILRACE TRAINING WALL
PLAN AND ELEVATION

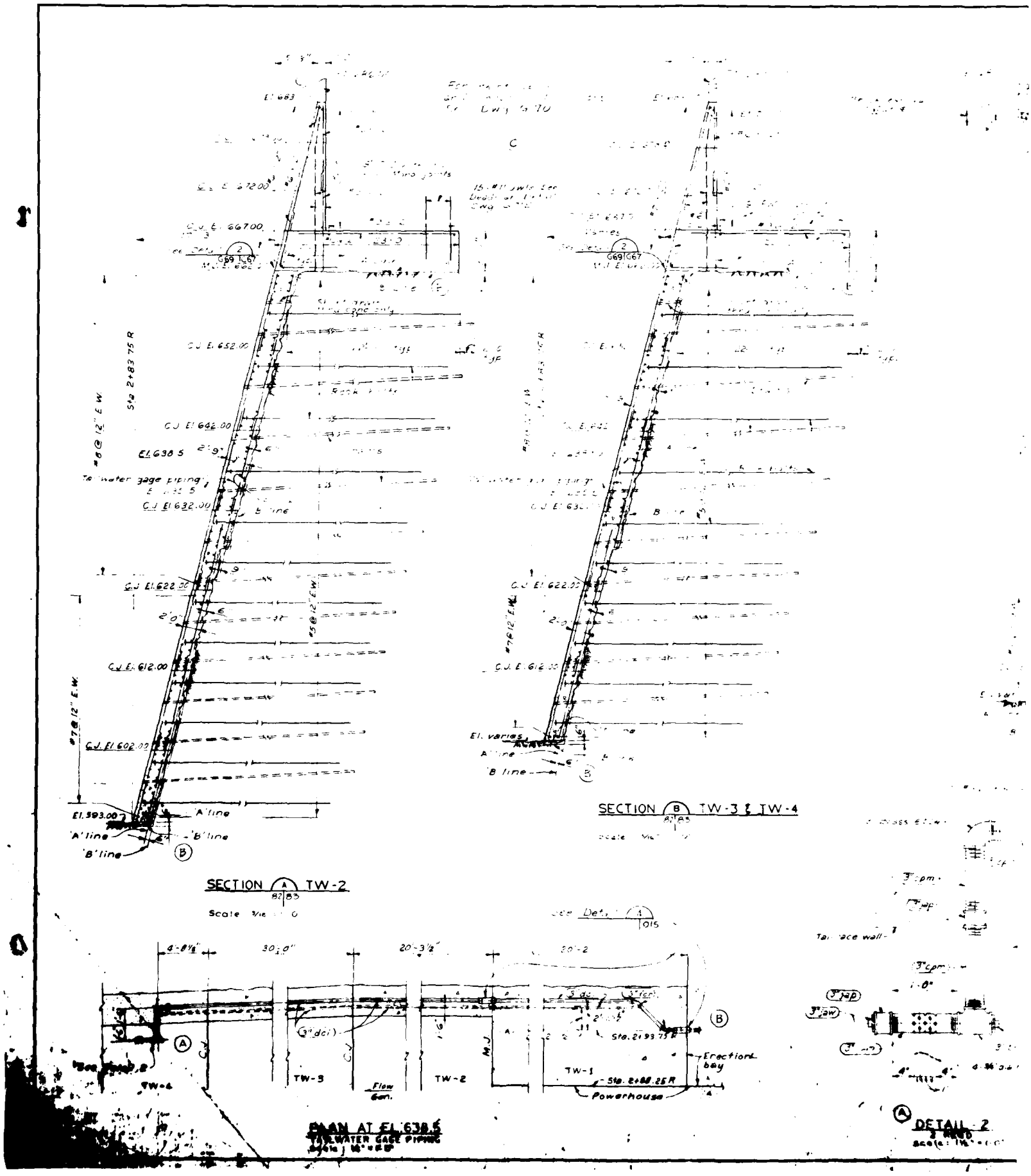
Scale

Date MARCH 1985

Sheet number

Dwg No. 0-12-9212

PLATE NO 82


SECTION A TW-2
SECTION B TW-3 & TW-4
PLAN AT El. 638.5
DETAIL 2
Powerhouse
Erection bay
Flow Gen.
TW-1
TW-2
TW-3
TW-4
Sta. 2+93.75 R
Sta. 2+88.25 R
A line
B line
El. 593.00
El. 638.5
El. varies

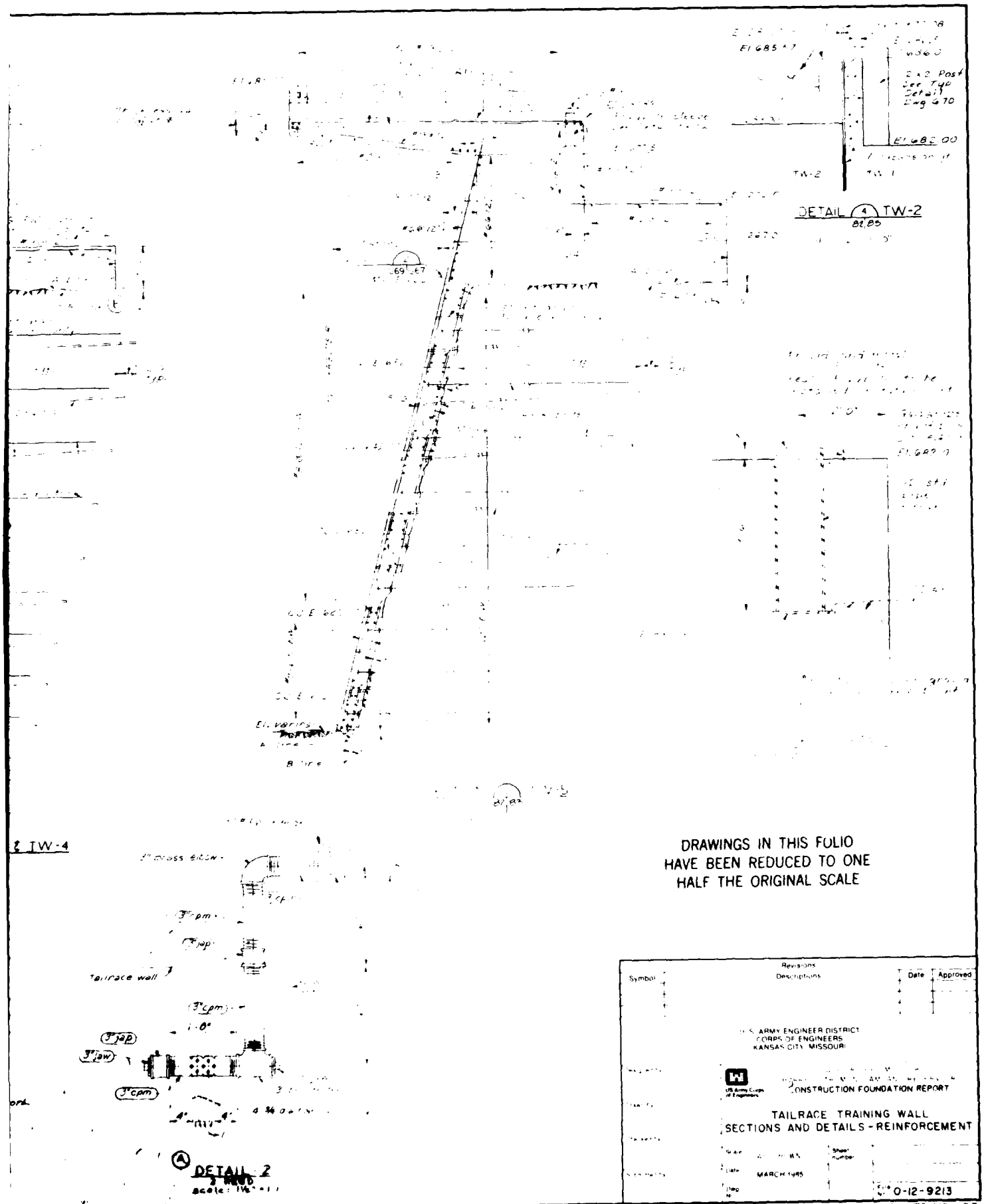
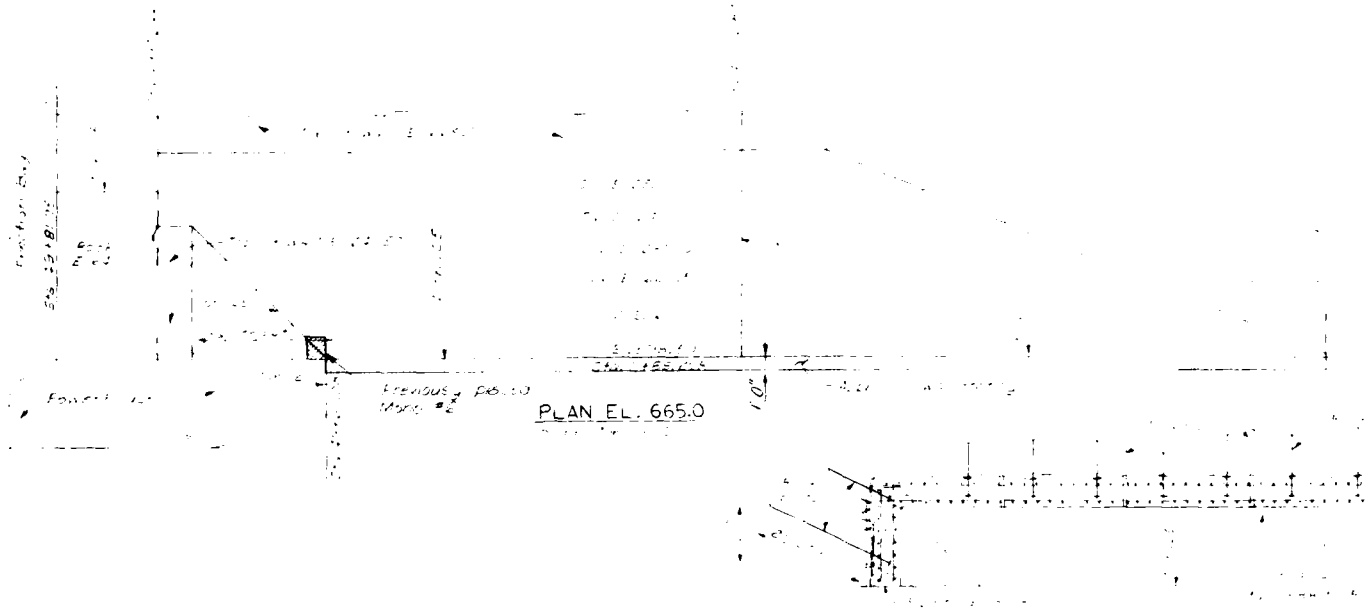
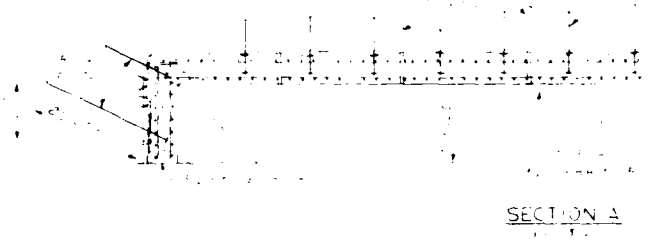
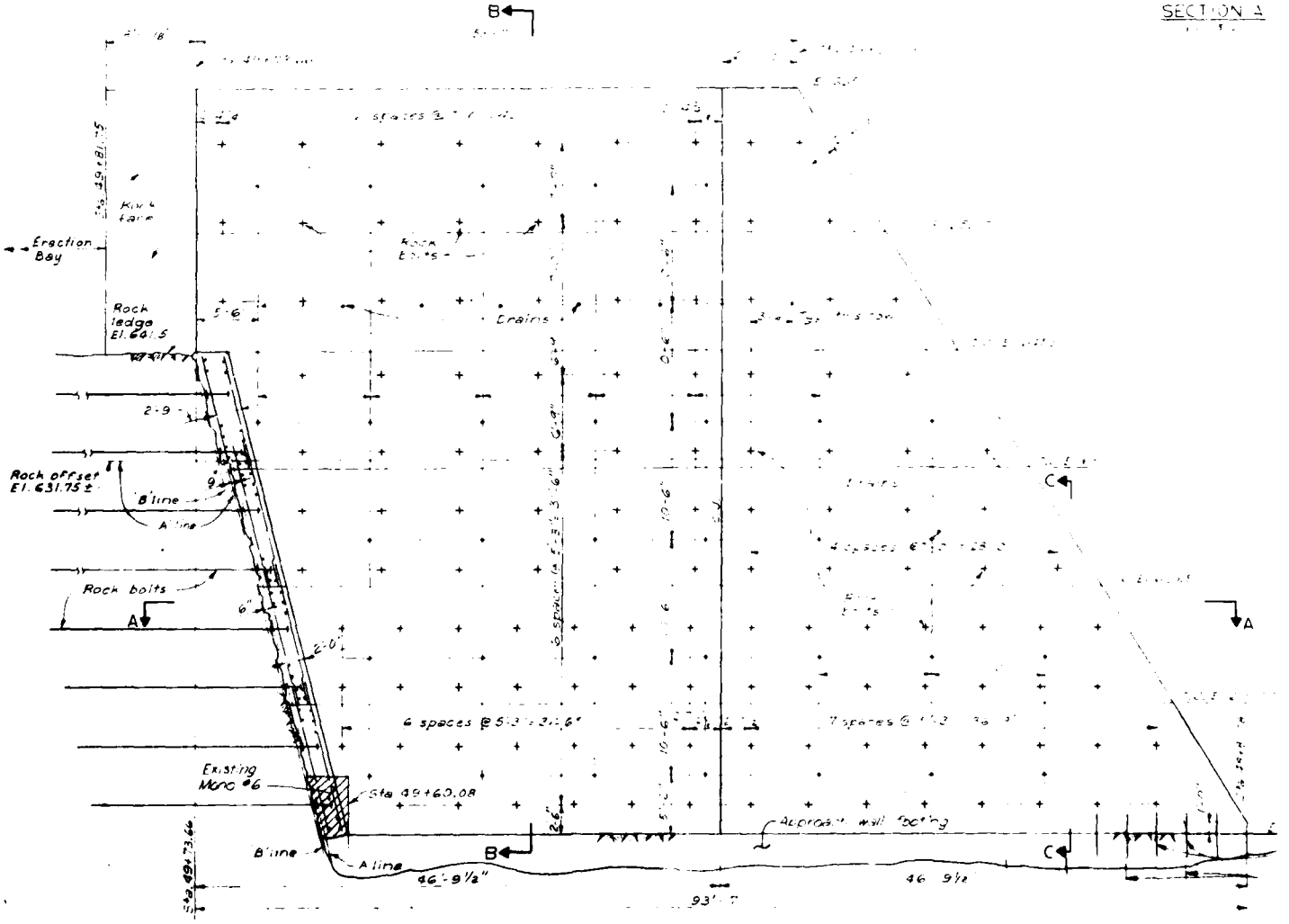

DETAIL 4 TW-2
TW-2
TW-4
Tailrace wall
DETAIL 2
DRAWINGS IN THIS FOLIO
HAVE BEEN REDUCED TO ONE
HALF THE ORIGINAL SCALE
Symbol
Revisions
Descriptions
Date
Approved
U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI
CONSTRUCTION FOUNDATION REPORT
TAILRACE TRAINING WALL
SECTIONS AND DETAILS - REINFORCEMENT
MARCH 1985
0-12-9213

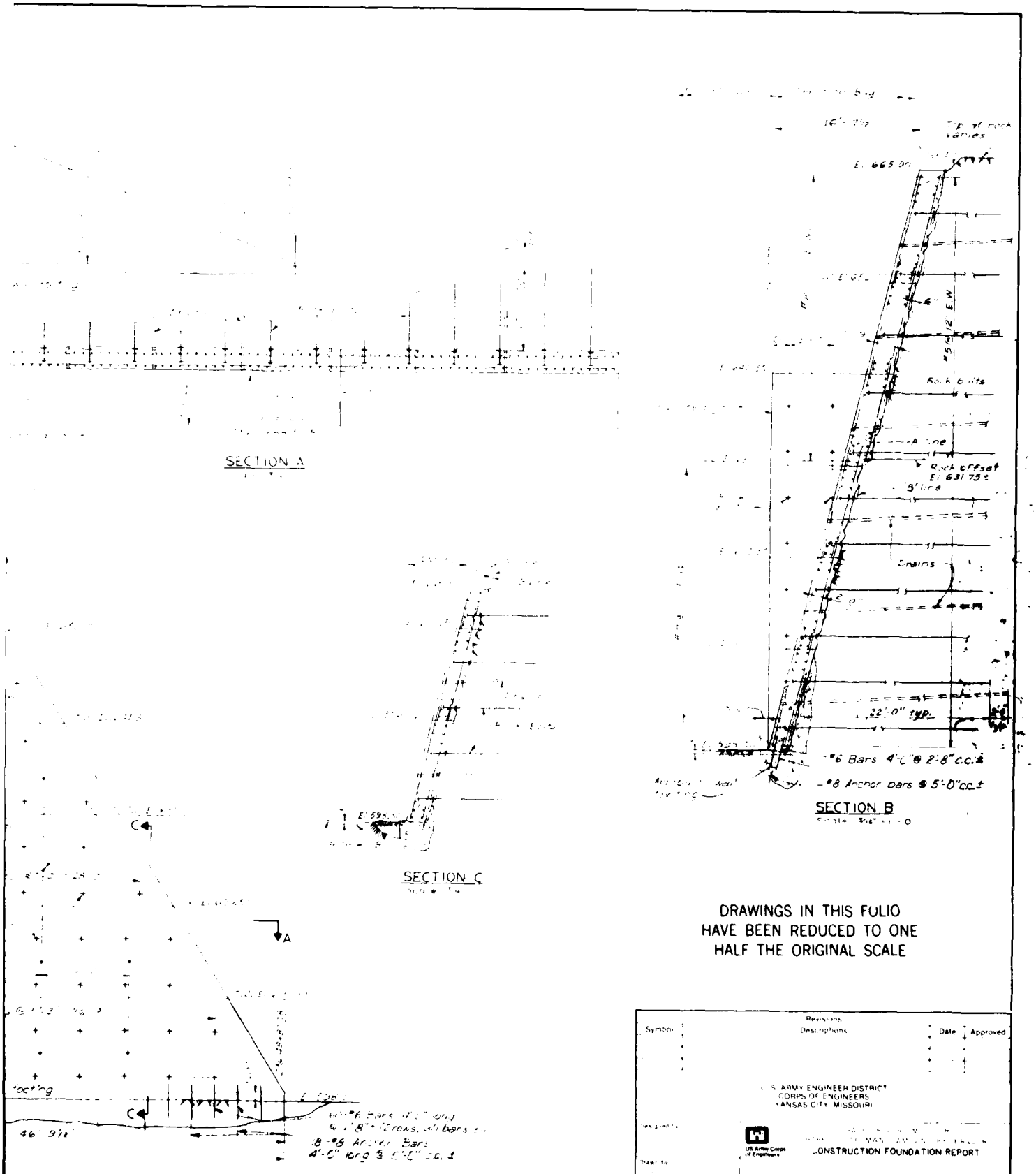
PLATE NO 83







ELEVATION
Scale 1/16" = 1'-0"



DRAWINGS IN THIS FOLIO HAVE BEEN REDUCED TO ONE HALF THE ORIGINAL SCALE

Symbol	Revisions Descriptions	Date	Approved

U. S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

US Army Corps of Engineers

CONSTRUCTION FOUNDATION REPORT

APPROACH WALL - POWERHOUSE

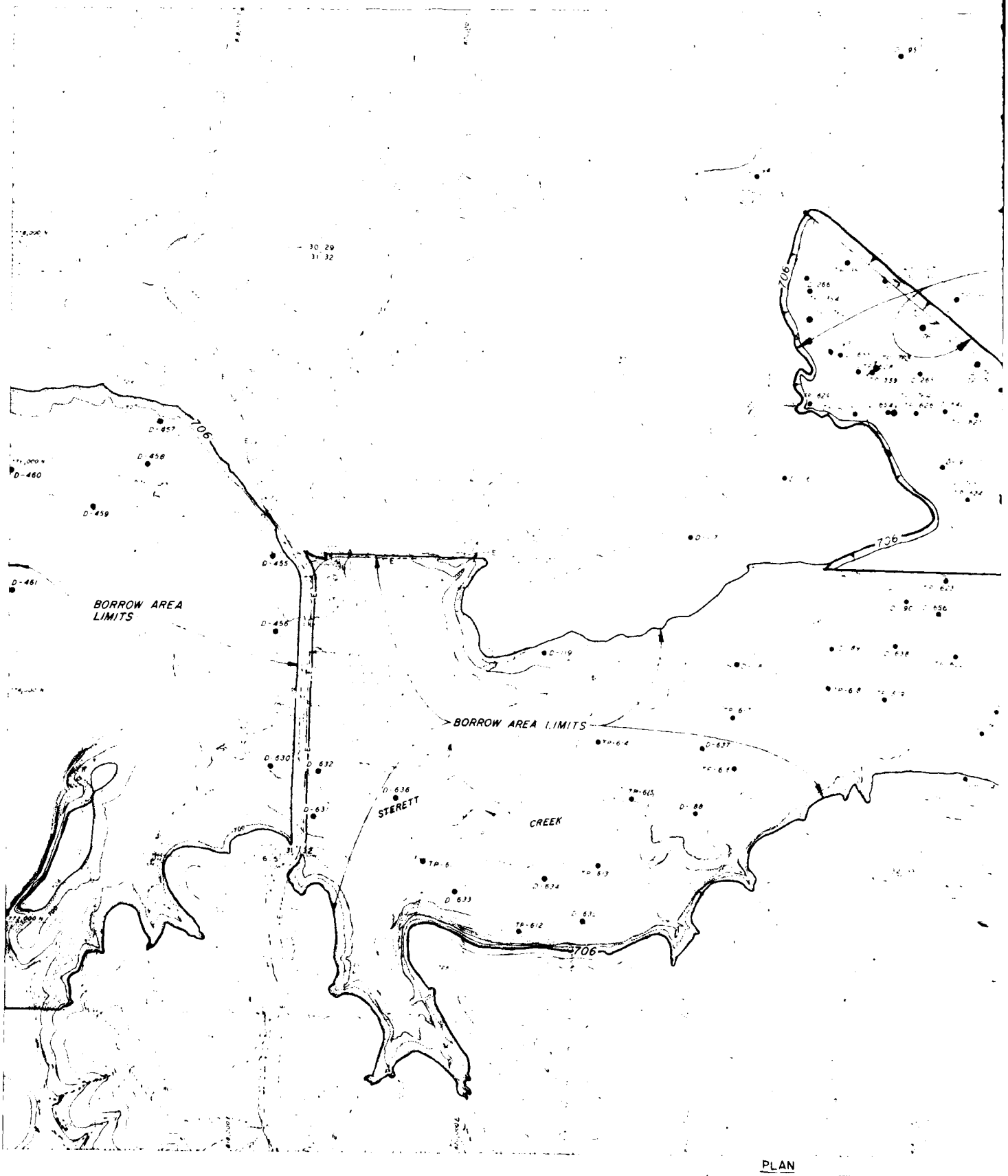
Scale: AS NOTED
Date: MARCH 1985
Sheet number
Dwg No.: 0-12-9214

PLATE NO. 84

STAGE IV CONSTRUCTION

STRUCTION

STAGE IV CONSTRUCTION



DRAWINGS IN THIS FOLIO
HAVE BEEN REDUCED TO ONE
HALF THE ORIGINAL SCALE

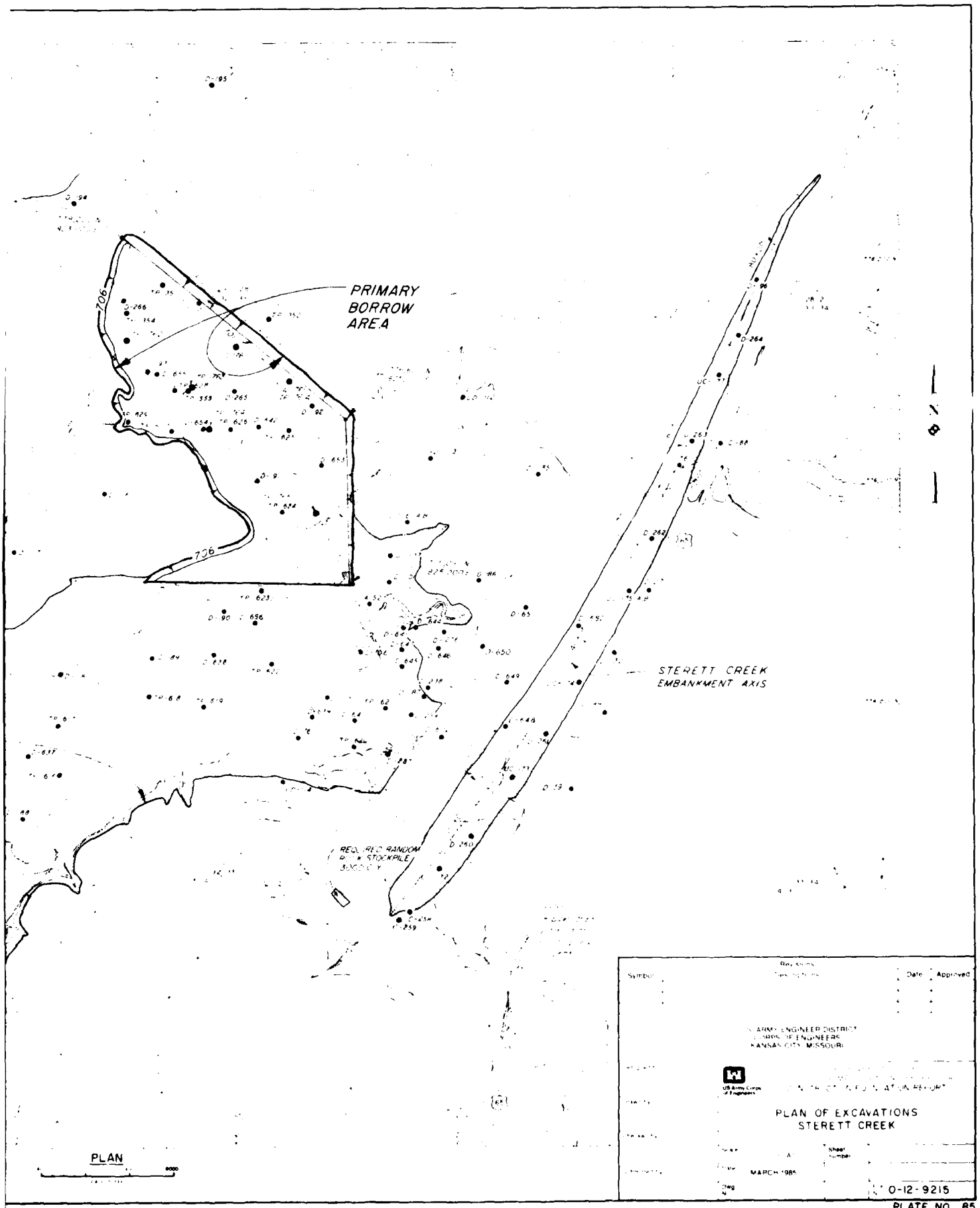
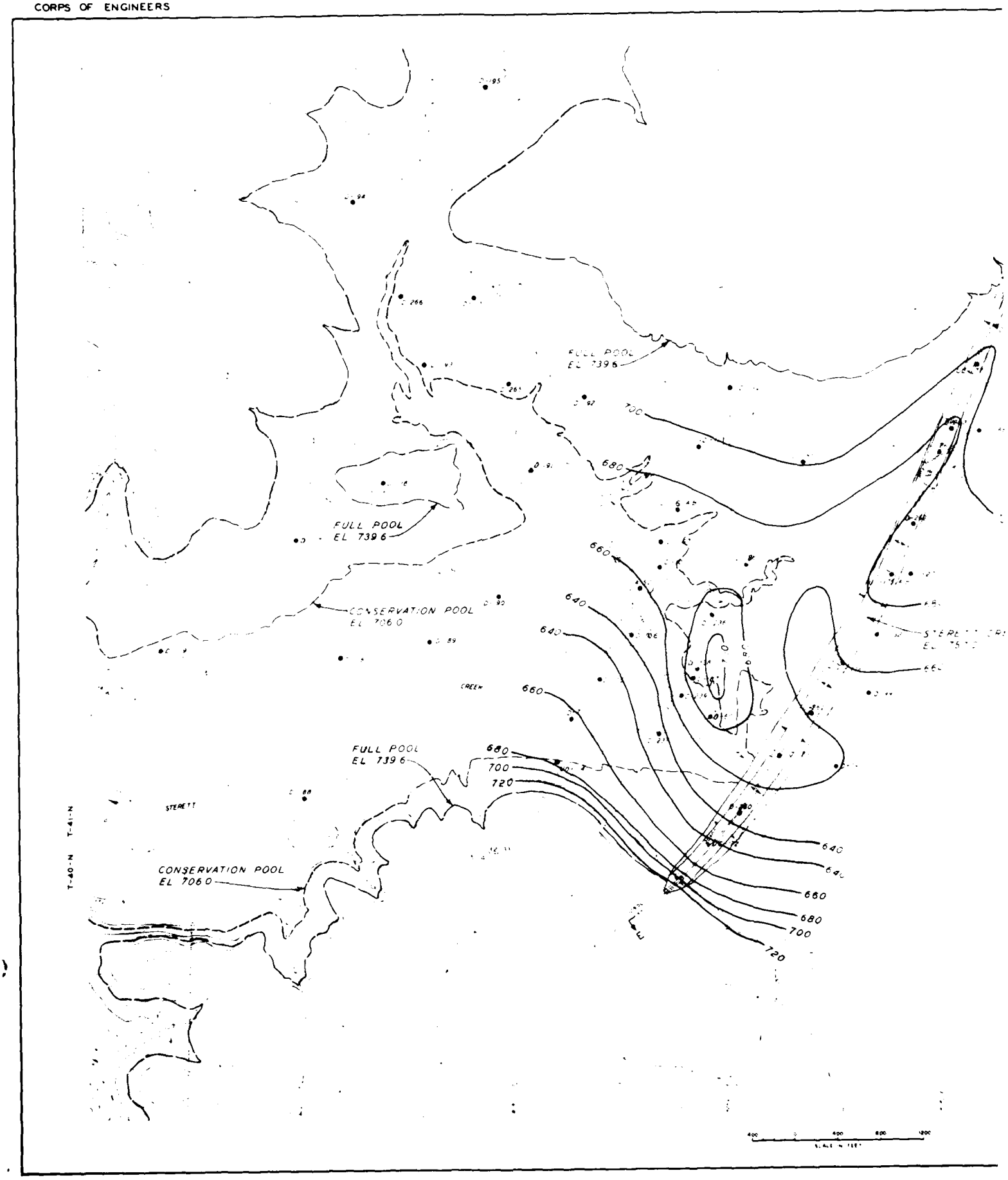
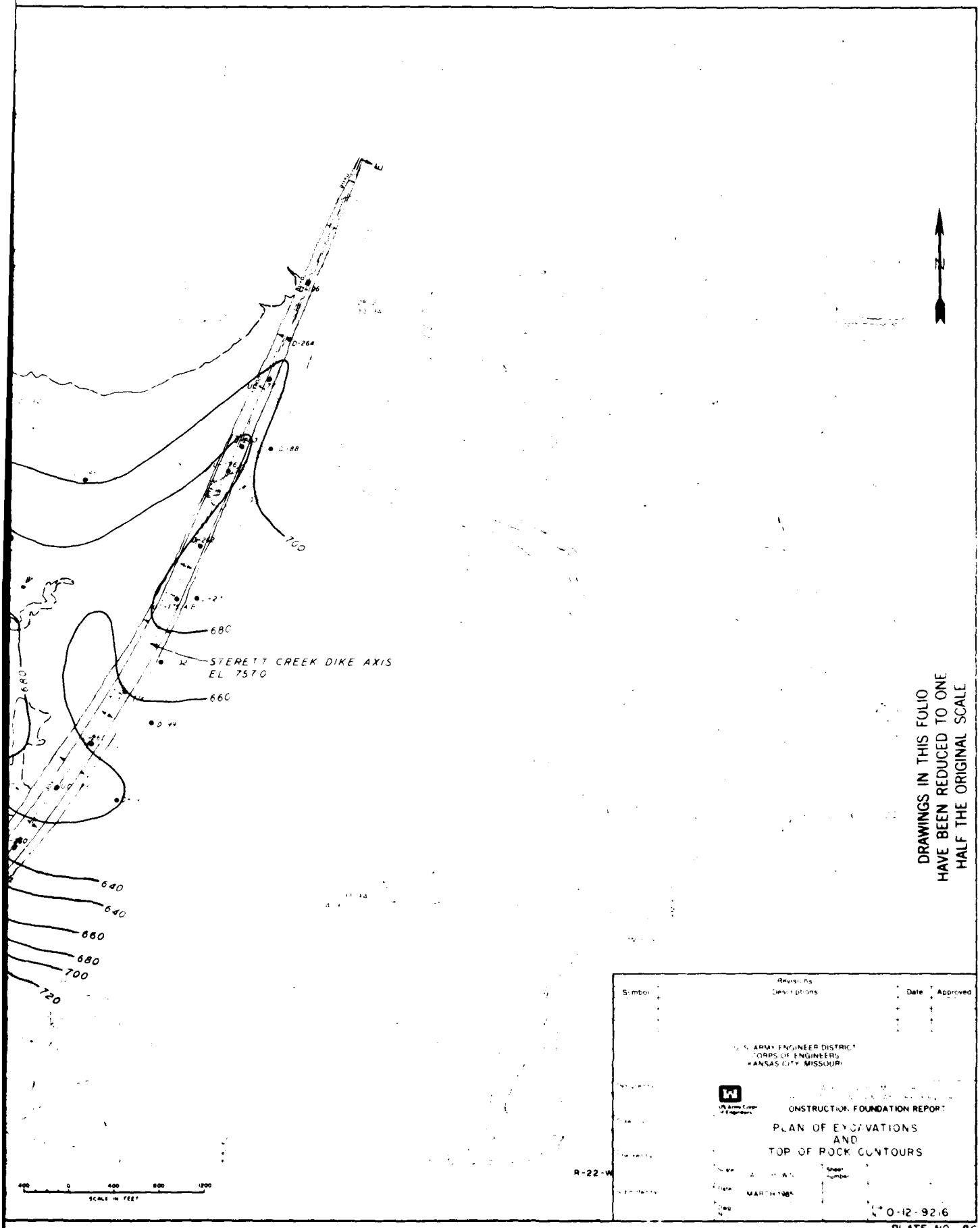

PRIMARY
BORROW
AREA
706
706
STERETT CREEK
EMBANKMENT AXIS
REQUIRED RANDOM
ROCK STOCKPILE
PLAN
PLAN OF EXCAVATIONS
STERETT CREEK
MARCH 1985
0-12-9215

PLATE NO. 85

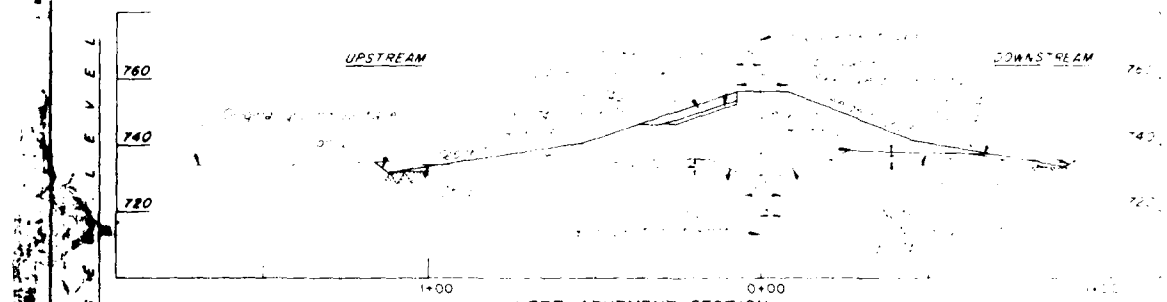
CORPS OF ENGINEERS



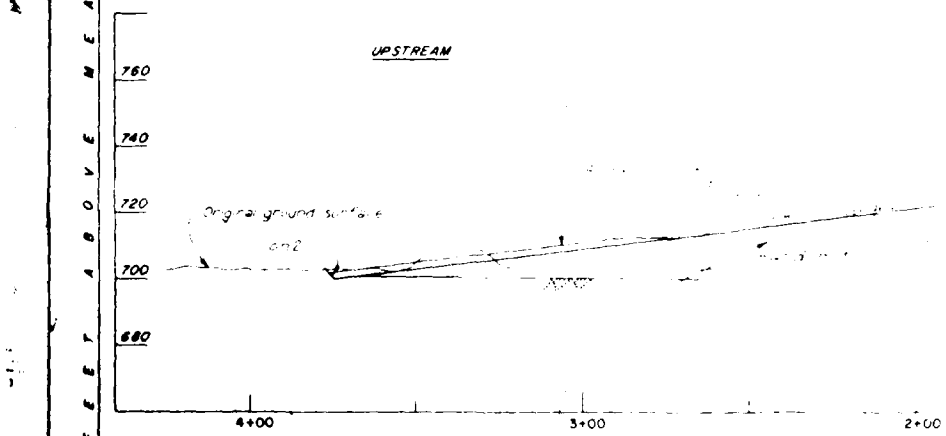


DRAWINGS IN THIS FOLIO
HAVE BEEN REDUCED TO ONE
HALF THE ORIGINAL SCALE

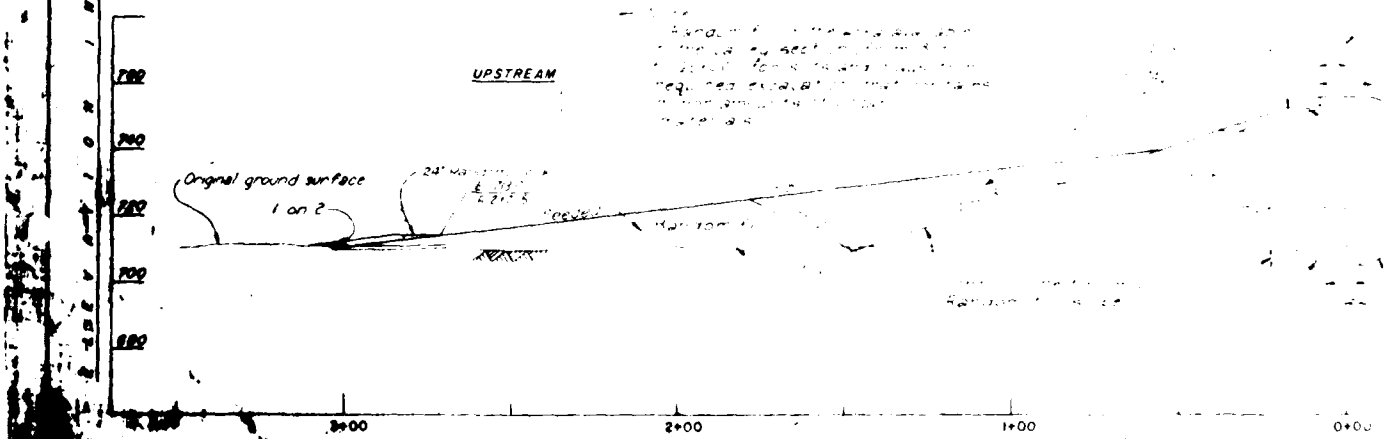
OVERBUILD DETAIL



LEFT ABUTMENT SECTION
STA 73+00 TO STA 85+60±



VALLEY SECTION
STA 11+40 TO STA 33+00

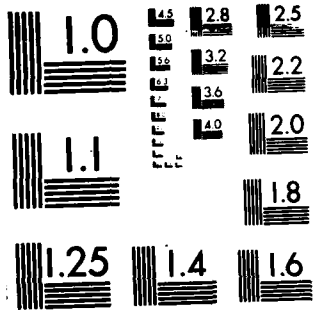


VALLEY SECTION
STA 33+00 TO STA 73+00

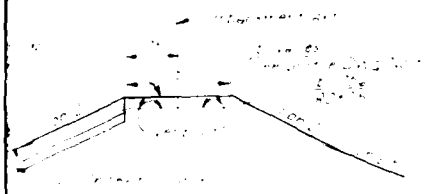
ELEVATION IN FEET ABOVE MEAN SEA LEVEL

AD-A154 456 OSAGE RIVER BASIN OSAGE RIVER MISSOURI HARRY S TRUMMAN DAM & RESERVOIR MU..(U) CORPS OF ENGINEERS KANSAS CITY MO KANSAS CITY DISTRICT R F GRIFFITH ET AL. 1984 3/4

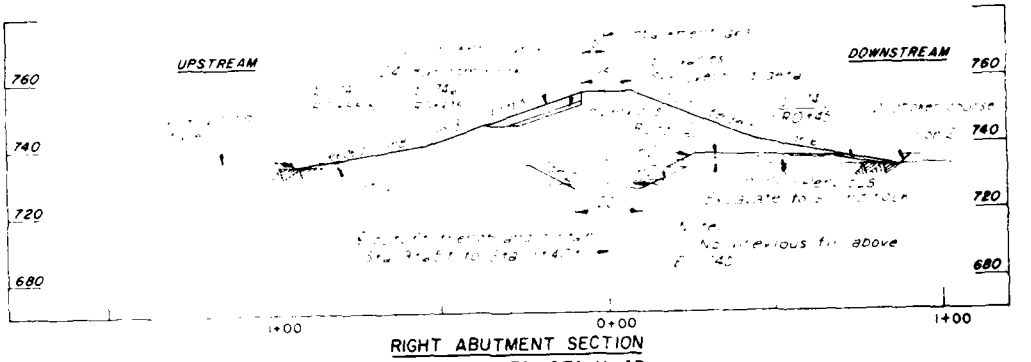
UNCLASSIFIED F/G 13/13 NL



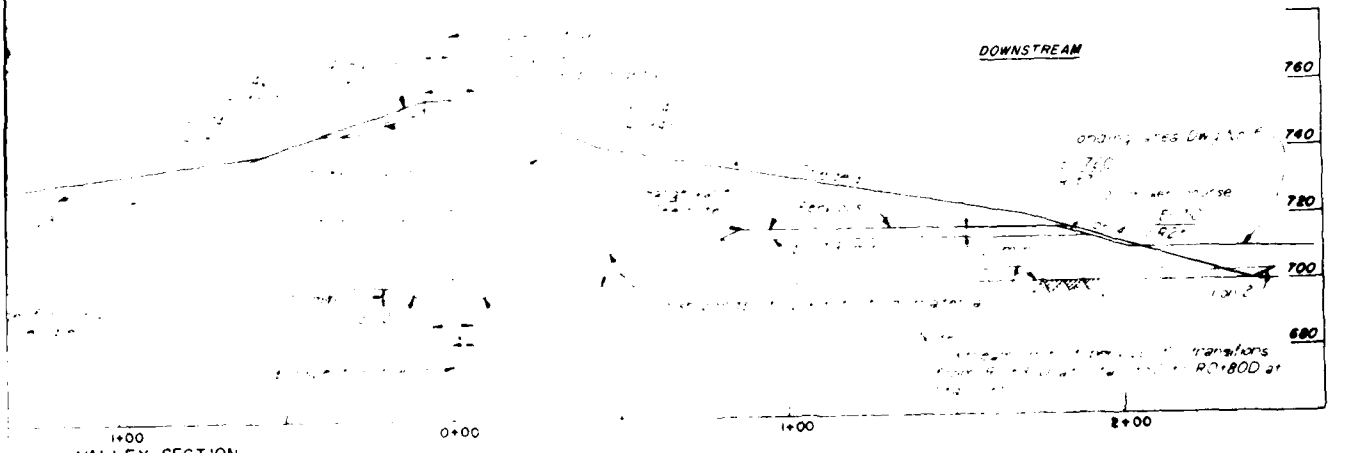
MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS 1963 A



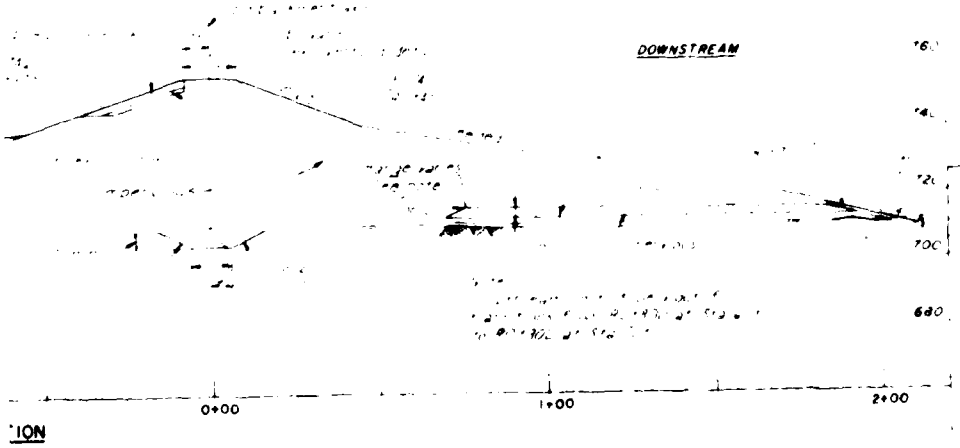
OVERBUILD DETAIL



RIGHT ABUTMENT SECTION
STA. 9+70± TO STA 11+40



VALLEY SECTION
STA 11+40 TO STA 33+00



ION
73+00

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HAVE BEEN REDUCED TO ONE
HALF THE ORIGINAL SCALE

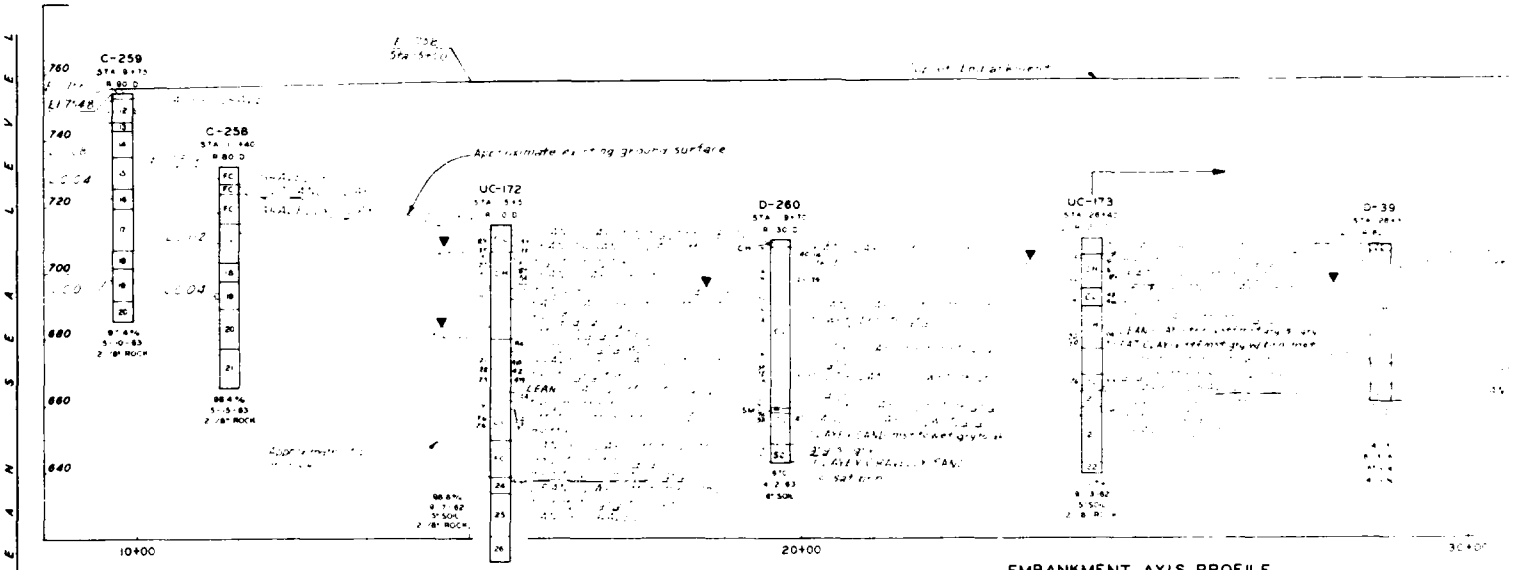
Date Approved

INSTRUCTION FOUNDATION REPORT

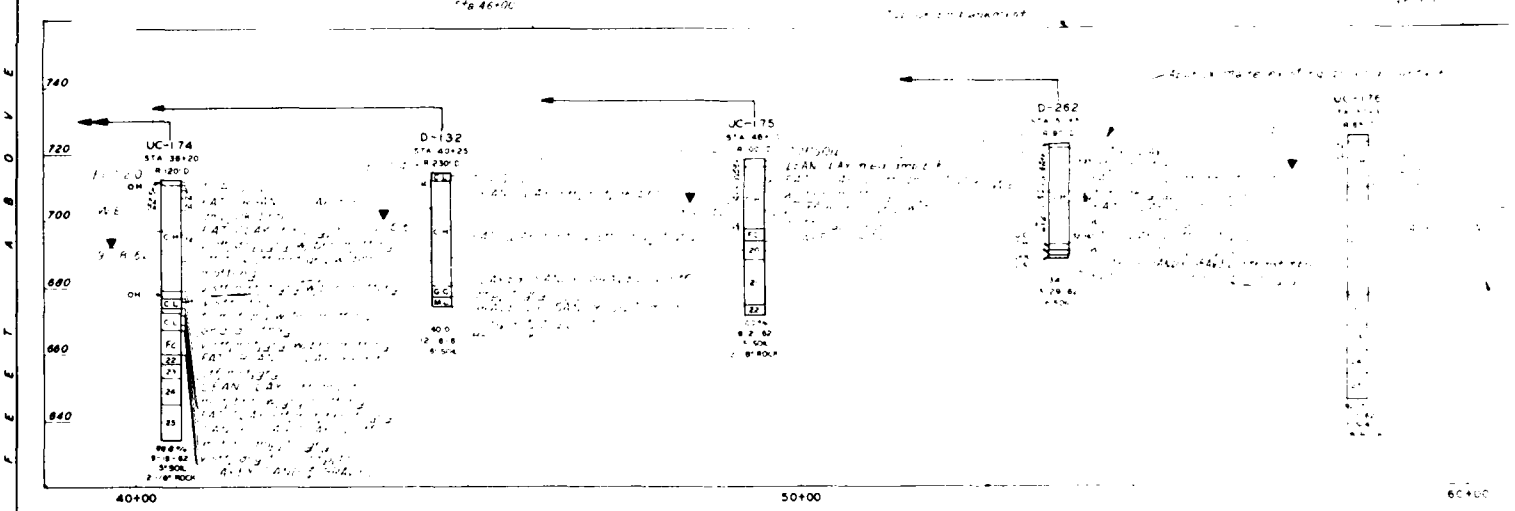
EMBANKMENT SECTIONS
TERETT CREEK

0-12-9217

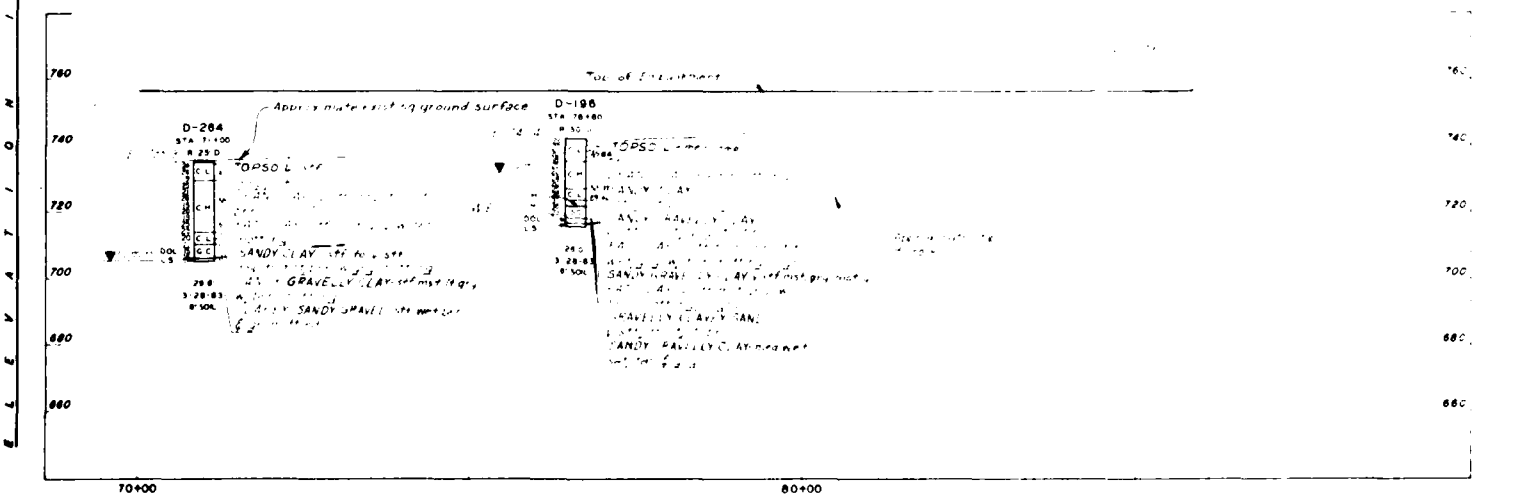
PLATE NO. 87



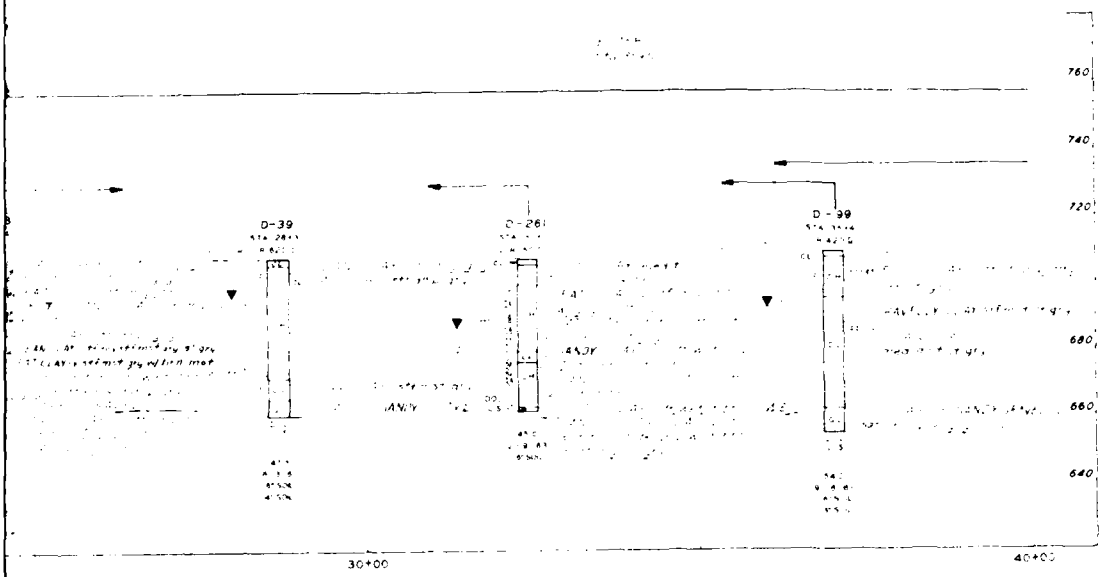
EMBANKMENT AXIS PROFILE



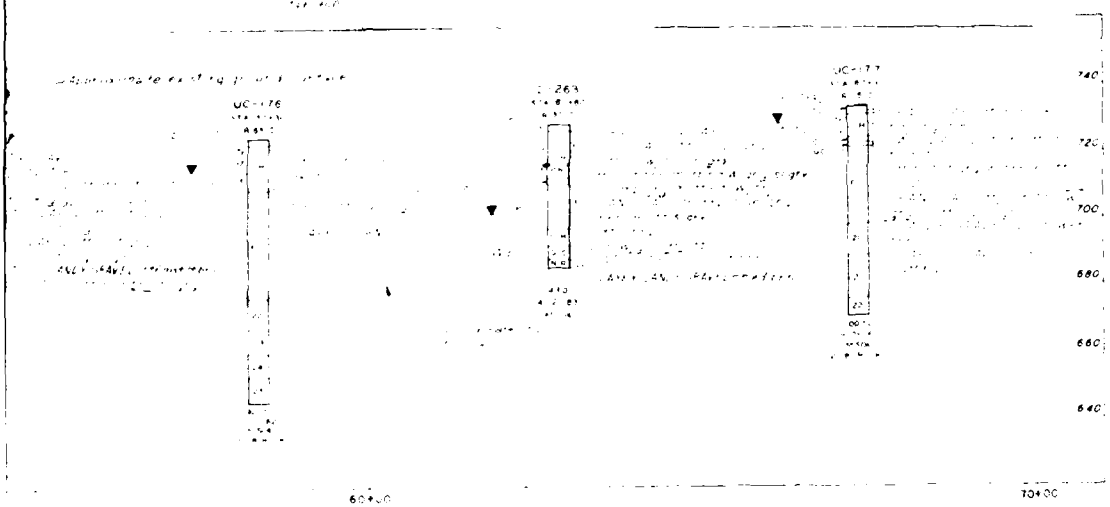
EMBANKMENT AXIS PROFILE



EMBANKMENT AXIS PROFILE



NT AXIS PROFILE



NT AXIS PROFILE

Plate 85

DRAWINGS IN THIS FOLIO HAVE BEEN REDUCED TO ONE HALF THE ORIGINAL SCALE

Symbo	Revisions Descriptions	Date	Approved

ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

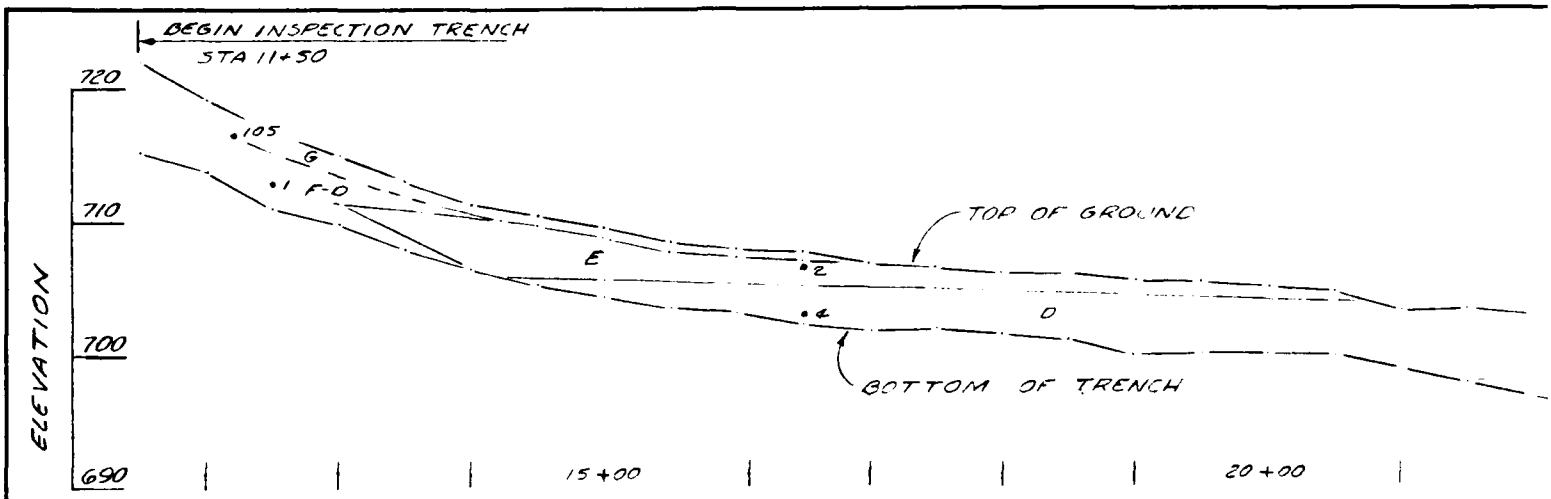
US Army Corps of Engineers

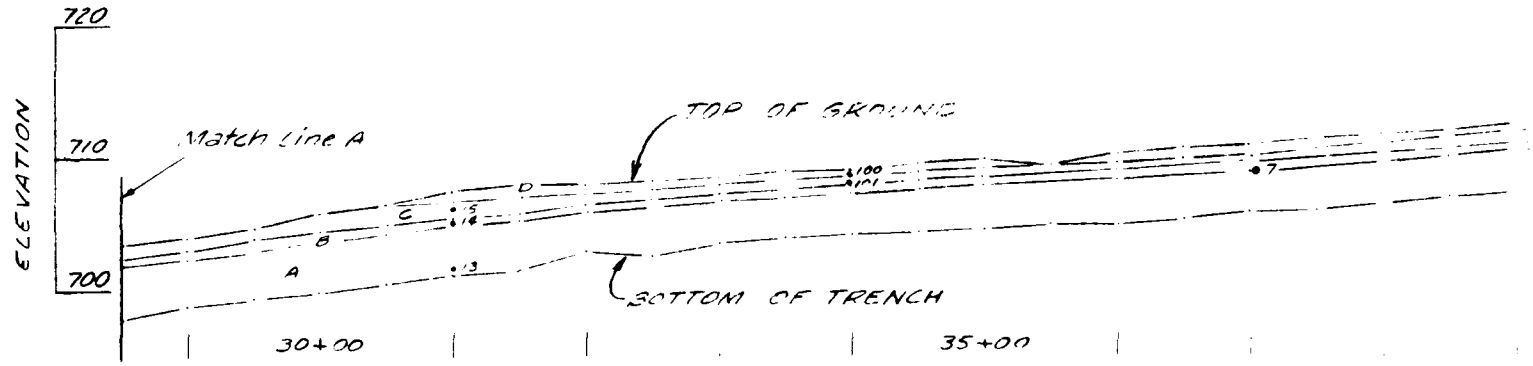
CONSTRUCTION FOUNDATION REPORT

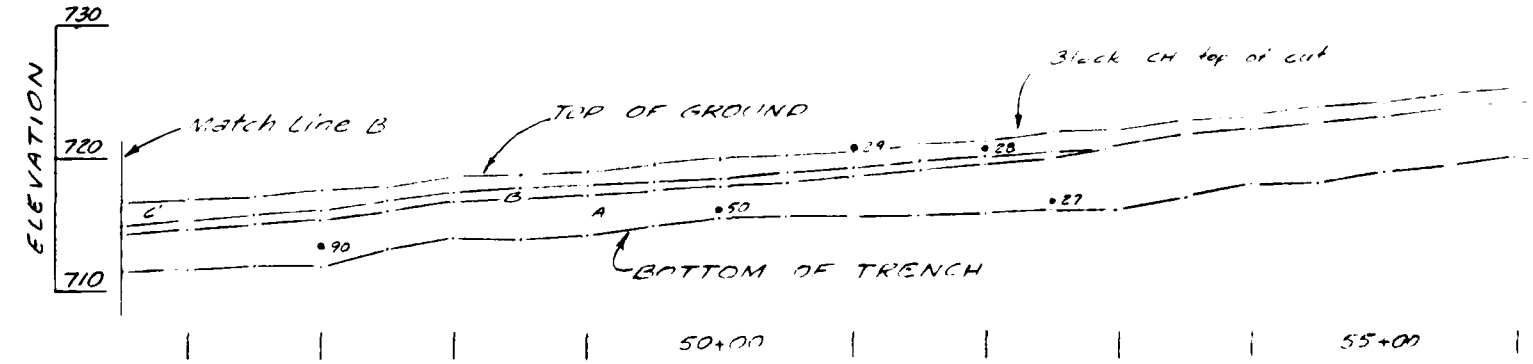
EMBANKMENT AXIS PROFILE
LOGS OF EXPLORATIONS
STERETT CREEK

Scale: AS
Date: MARCH 1985
Sheet number
Drawing No: 0-12-9218

PLATE NO. 88







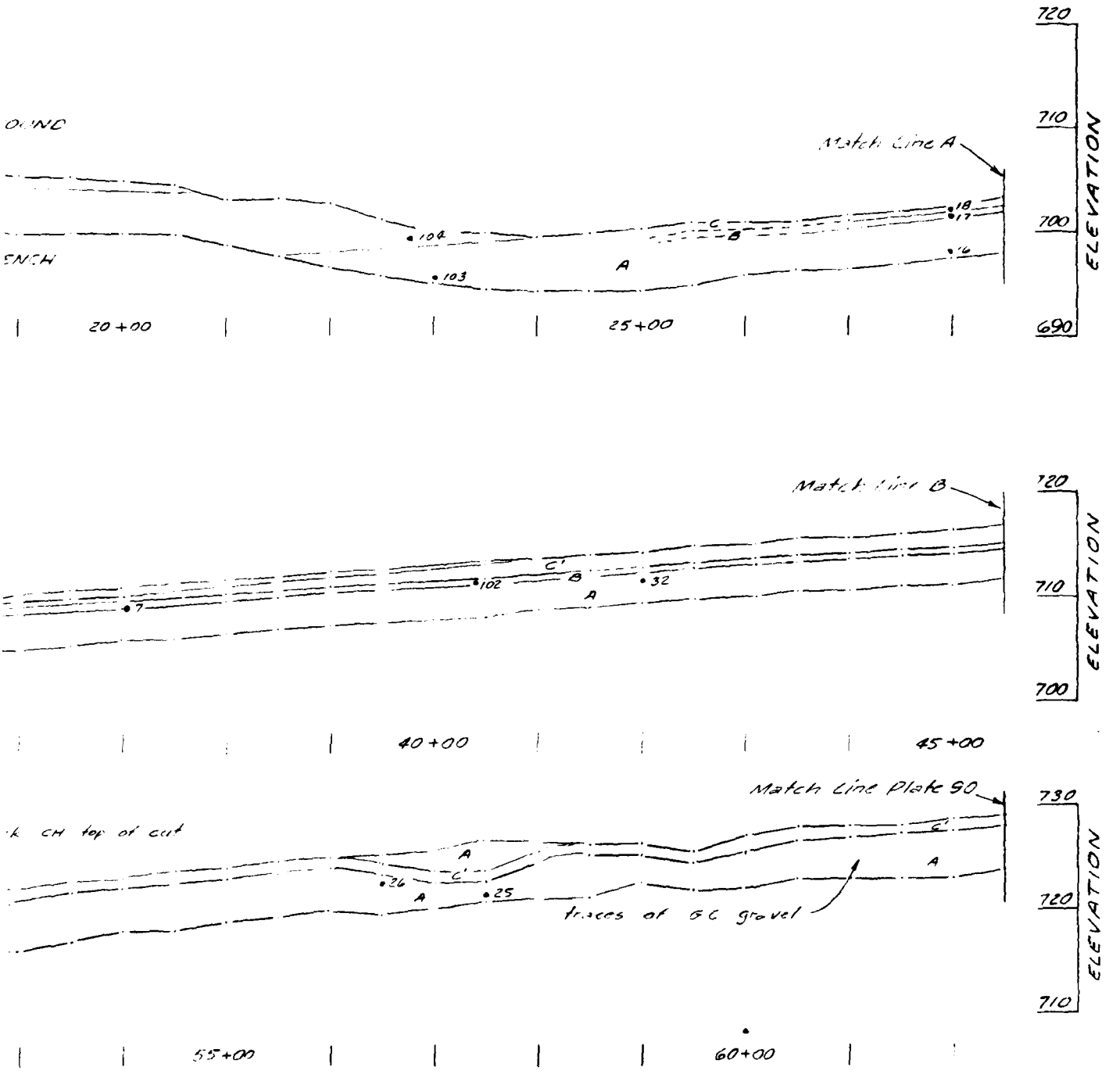
STERETT CREEK DIKE

INSPECTION TRENCH DIKE STA

LOOKING UPSTREAM

for

SCALE AS SHOW



CREEK DIKE STAGE IV

STA 11+50 TO STA 62+50

UPSTREAM

for Legend See Plate 90

SCALE AS SHOWN

Revisions			
Symbol	Descriptions	Date	Approved

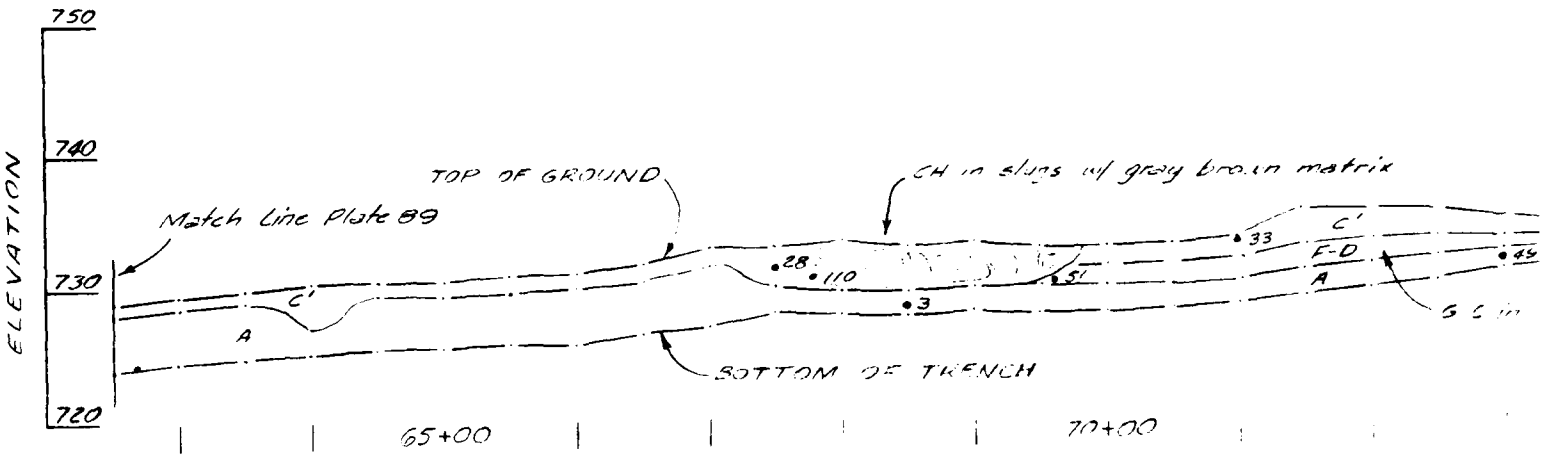
U. S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

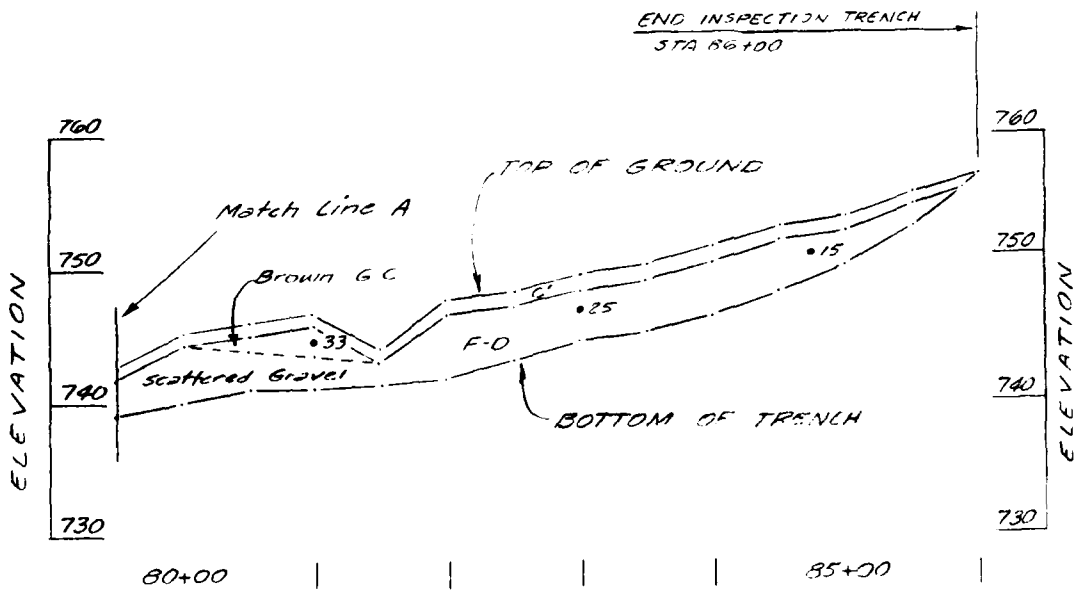
OSAGE RIVER, MISSOURI
HARRY S. TRUMAN DAM & RESERVOIR
CONSTRUCTION FOUNDATION REPORT

STERETT CREEK DIKE
INSPECTION TRENCH PROFILE
STA. 11 + 50 TO STA. 62+50

Designed by:
Drawn by:
Checked by:
Submitted by:
Scale:
Date: MARCH 1966
Sheet number:
File No. 0-12-9219

PLATE NO. 89





LEGEND

Zone		
A	CH	Gray with local
B	CH	Gray with gray b
C	CH	Light brown gr
D	CH	Dark gray gray b
E	CH	Gray
F-D	CH	Dark gray gray b
G	CH	Black

• = Sample number, LL = Lig

ZONE A		
•	LL	PI
103	76	49
16	69	47
13	65	39
32	48	25
90	61	38
50	51	35
27	65	42
25	75	51
26	93	54
3	66	45
49	62	44
45	60	40

ZONE B	
•	LL
17	61
14	58
7	46
102	[illegible]

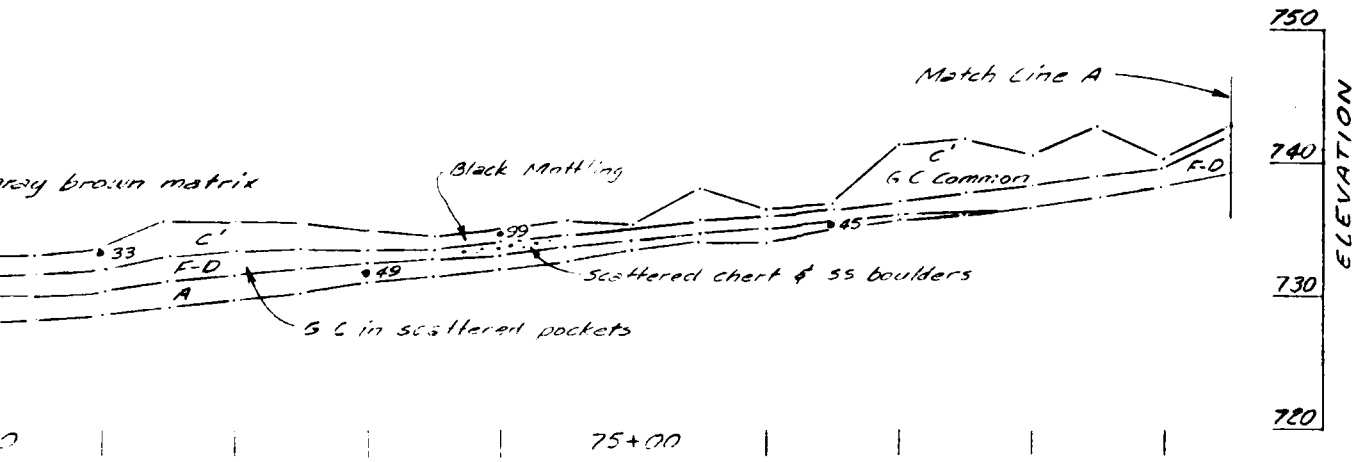
ZONE	
•	LL
2	

STERETT CREEK DIKE

INSPECTION TRENCH PROFILE STA 62

LOOKING UPSTREAM

SCALE AS SHOWN



LEGEND

ne

A CH Gray with locally brown mottling
3 CH Gray with gray black
C CH Light brown gray, C' Brown at base blending to black at top
D CH Dark gray gray black & brown gray
F CH Gray
F-D CH Dark gray, gray black & brown gray with gravel
S CH Black
• = Sample number, LL = Liquid Limit, PI = Plastic Index

ZONE A

•	LL	PI
103	76	49
16	69	47
13	66	39
32	48	25
90	61	38
50	51	35
27	65	42
25	75	51
26	93	54
3	66	45
49	62	44
45	60	40

ZONE B

•	LL	PI
17	61	37
14	58	37
7	46	28
102	52	26

ZONE C

•	LL	PI
18	78	53
15	88	51
101	66	42

ZONE C'

•	LL	PI
29	66	41
28	75	53
28A	58	25
110	53	33
33	55	35
99	53	32

ZONE D

•	LL	PI
4	78	53
104	62	39
100	82	47

ZONE E

•	LL	PI
2		

ZONE F-D

•	LL	PI
1	50	32
51	43	25
25	70	47
15	48	30
35	57	37

ZONE G

•	LL	PI
105	69	49

T CREEK DIKE STAGE IV

PROFILE STA 62+50 TO STA 86+00

UPSTREAM

SCALE AS SHOWN

Revisions			
Symbol	Descriptions	Date	Approved

U. S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

Designed by
Drawn by
Checked by
Submitted by

OSAGE RIVER, MISSOURI
HARRY S. TRUMAN DAM & RESERVOIR
CONSTRUCTION FOUNDATION REPORT

STERETT CREEK DIKE
INSPECTION TRENCH PROFILE
STA. 62 + 50 TO STA. 86+00

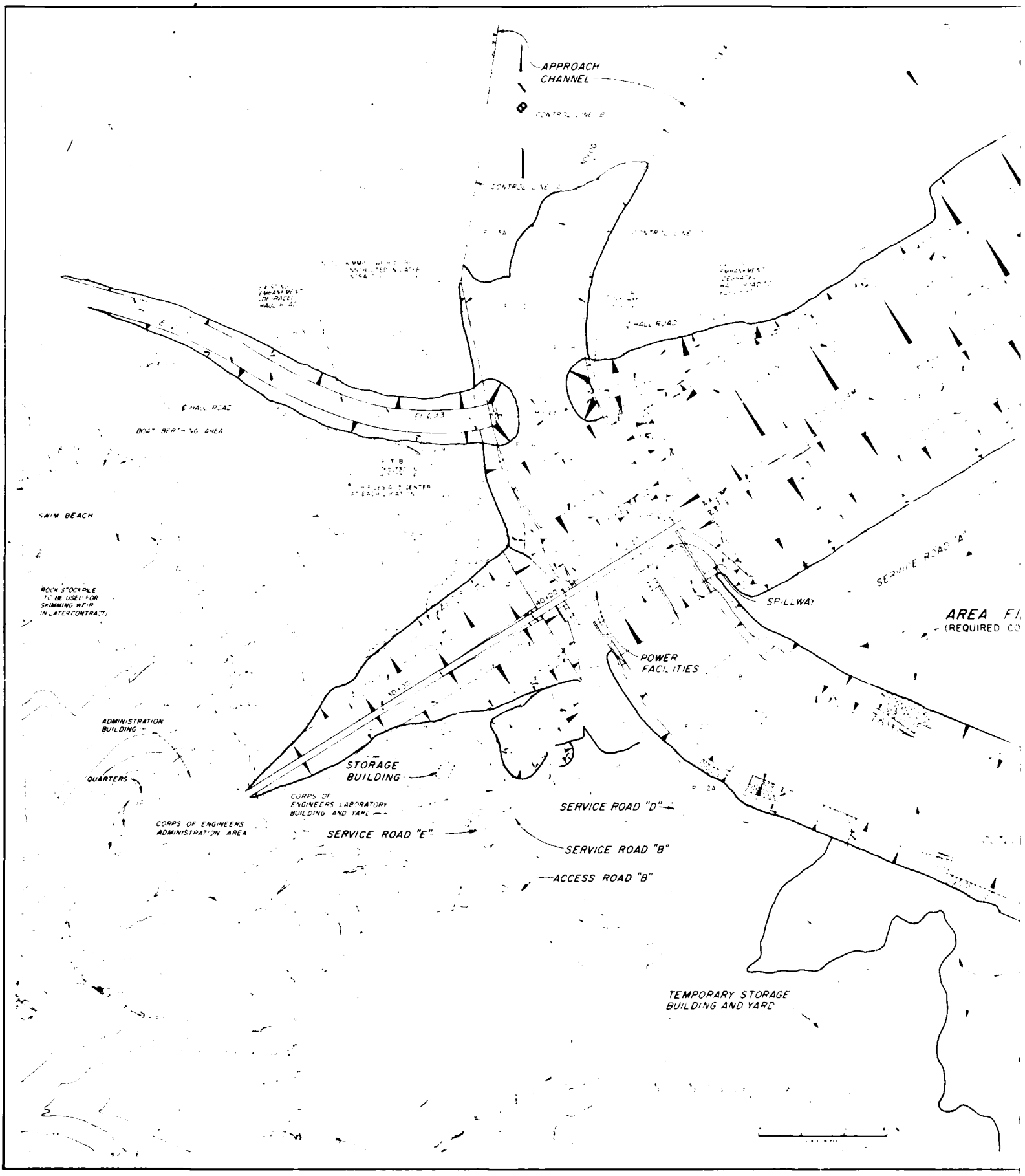
Scale
Sheet number
Date: MARCH 1986
Dwg No.
File No. 0-12-9220

PLATE NO. 90

STAGE VI CONSTRUCTION

RUCTION

STAGE VI CONSTRUCTION



DRAWINGS IN THIS FOLD

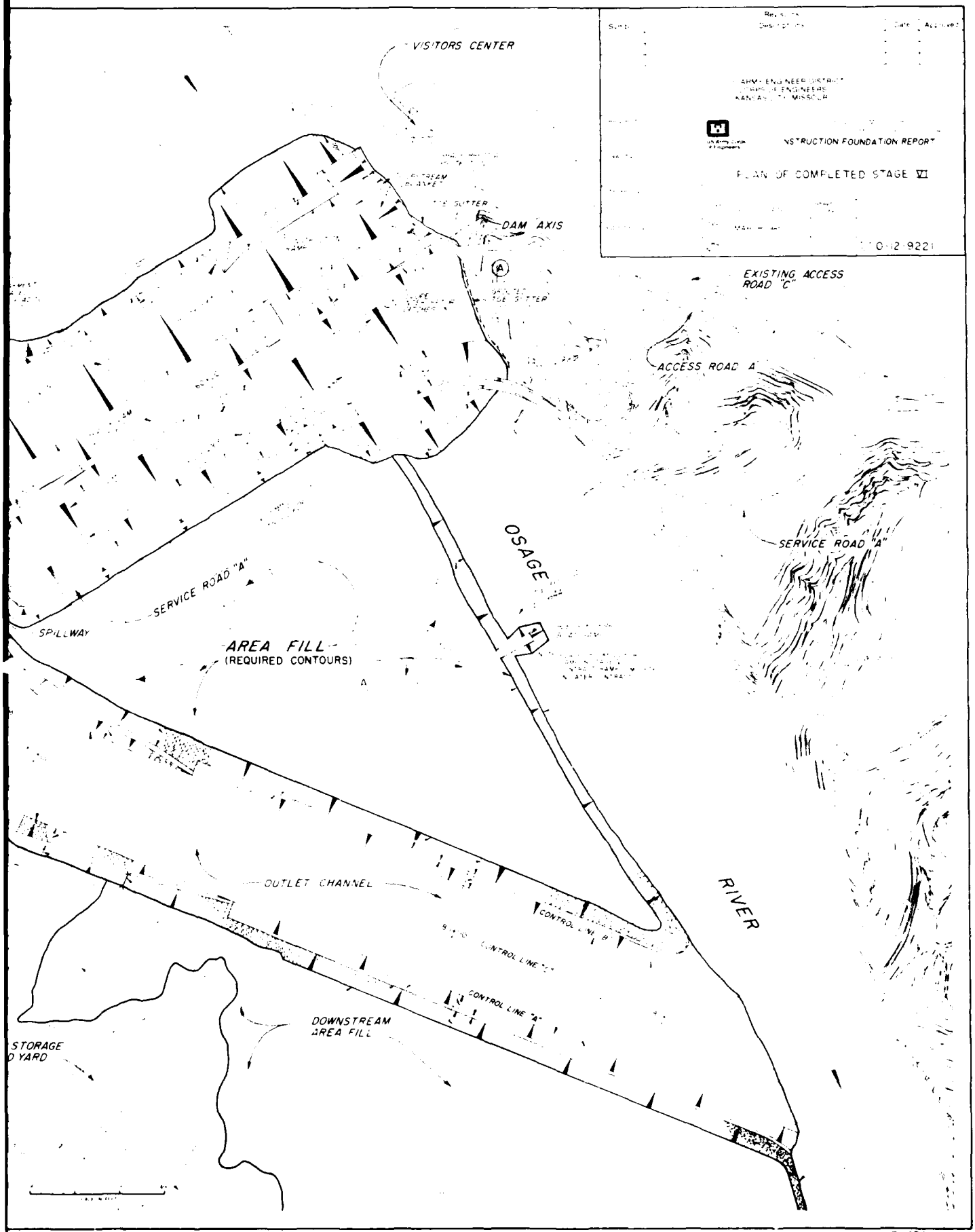
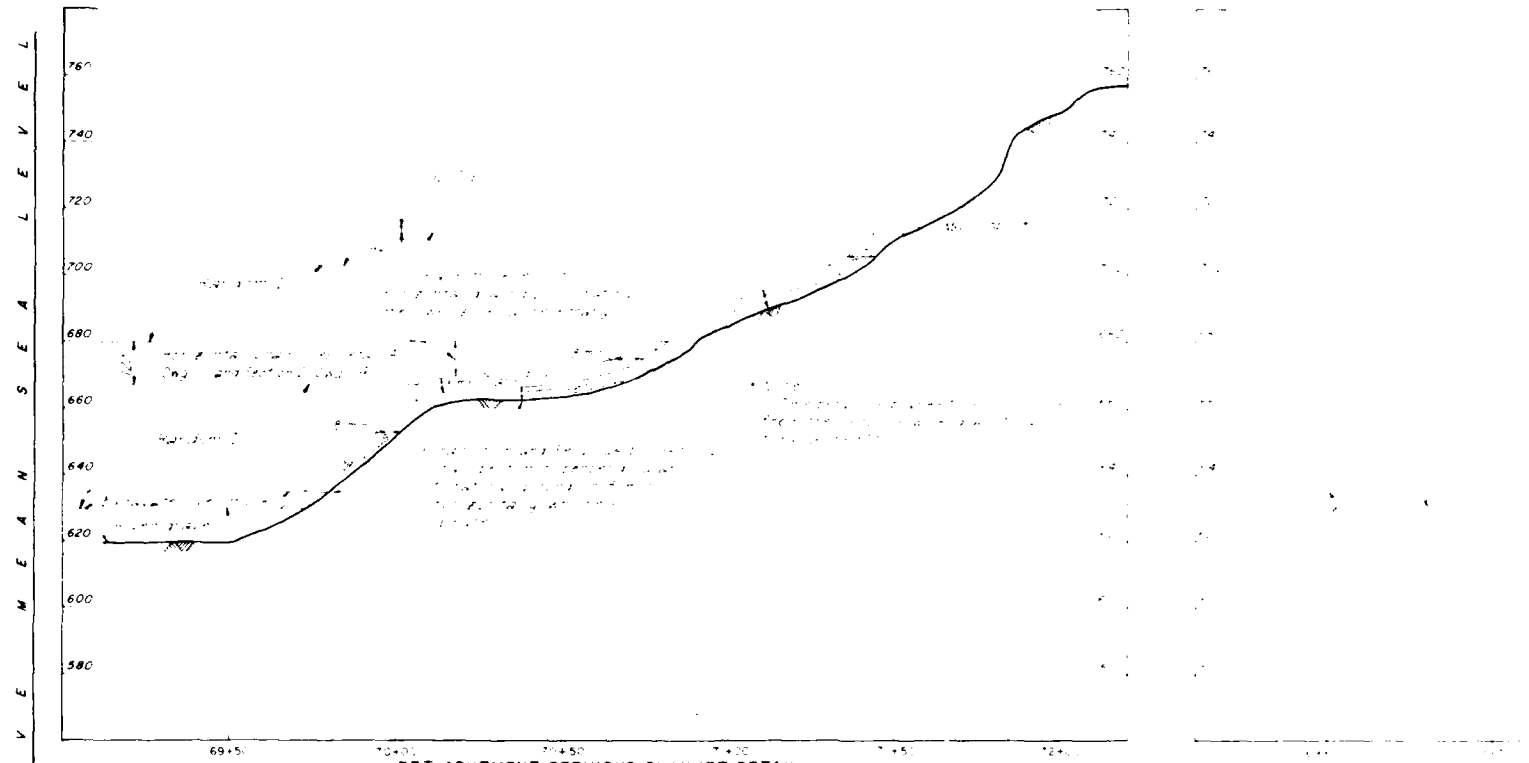
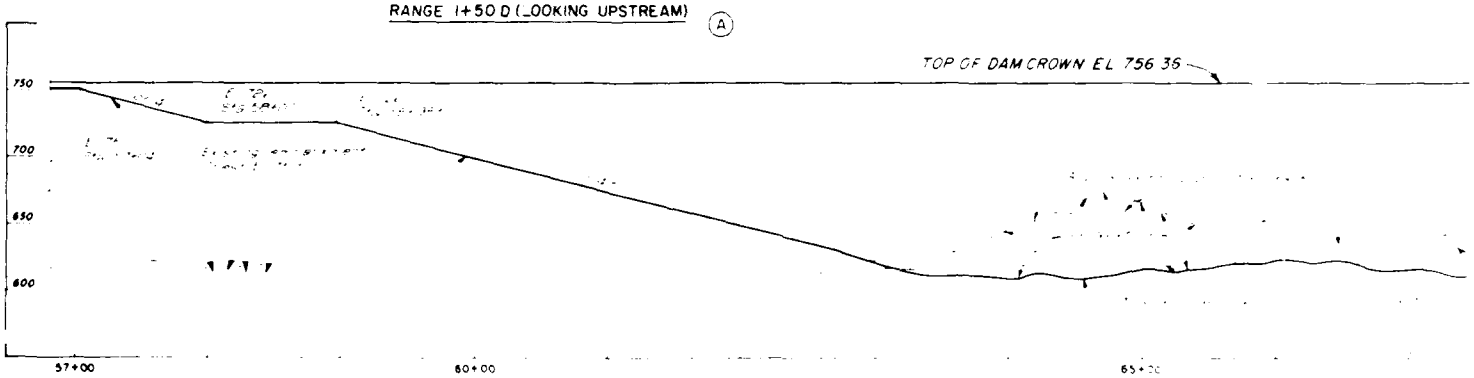

VISITORS CENTER
DAM AXIS
EXISTING ACCESS ROAD "C"
ACCESS ROAD A
SERVICE ROAD "A"
OSAGE
RIVER
SERVICE ROAD "A"
SPILLWAY
AREA FILL
(REQUIRED CONTOURS)
OUTLET CHANNEL
CONTROL LINE "B"
CONTROL LINE "A"
DOWNSTREAM AREA FILL
STORAGE
YARD
NSTRUCTION FOUNDATION REPORT
PLAN OF COMPLETED STAGE VI

PLATE NO. 9

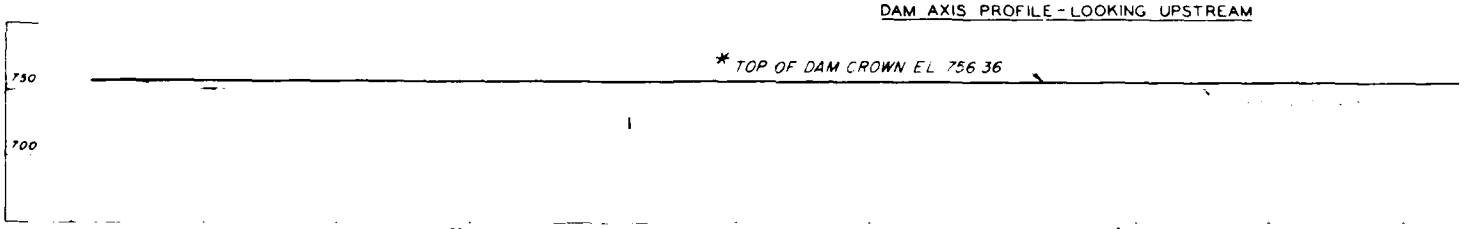


LEFT ABUTMENT PERVIOUS BLANKET DETAIL

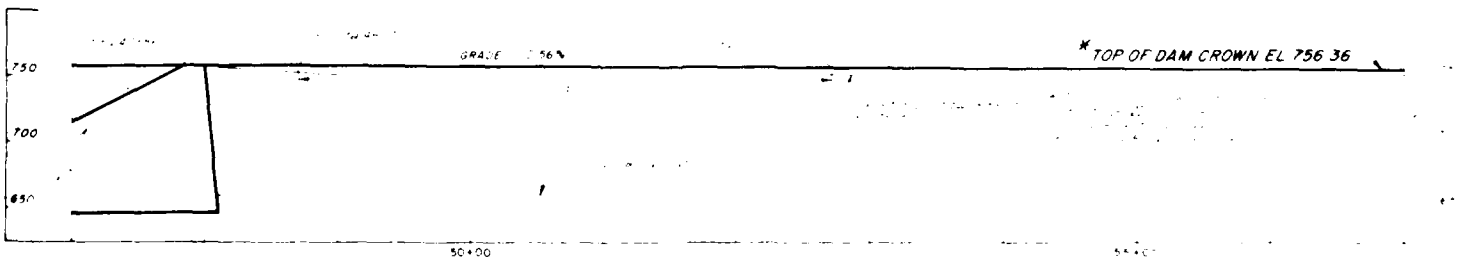
RANGE 1+50 D (LOOKING UPSTREAM) (A)



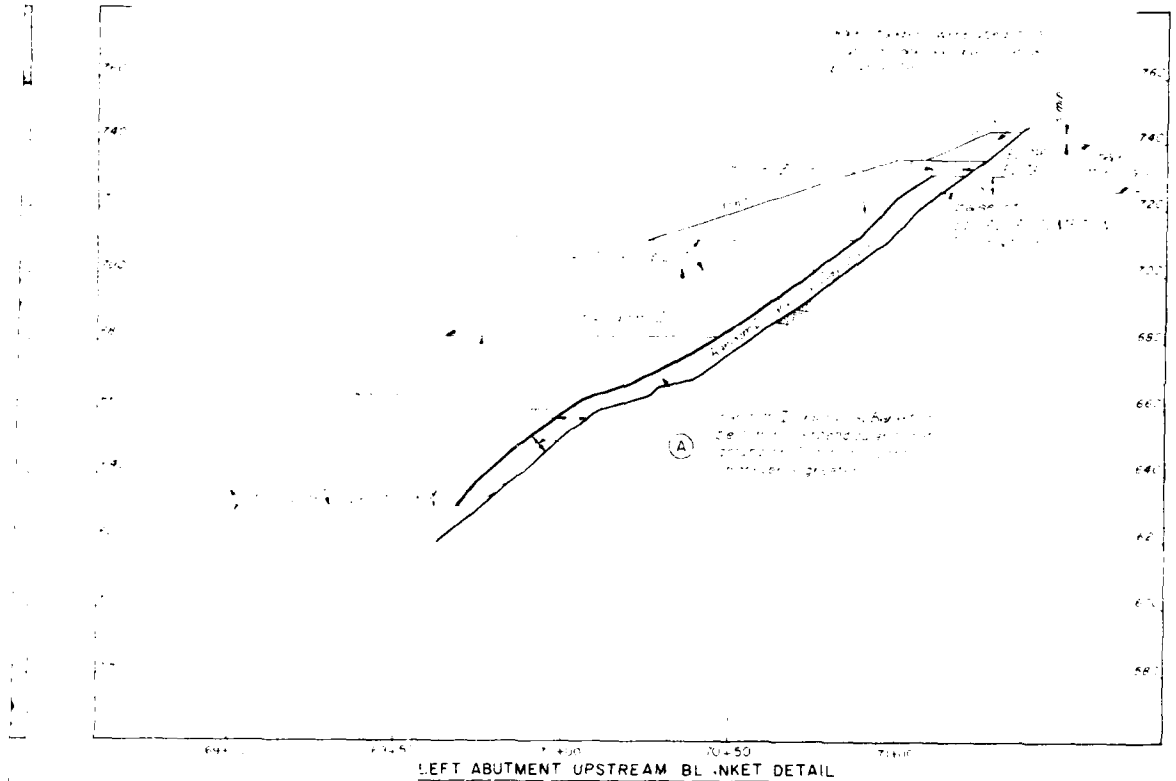
DAM AXIS PROFILE - LOOKING UPSTREAM



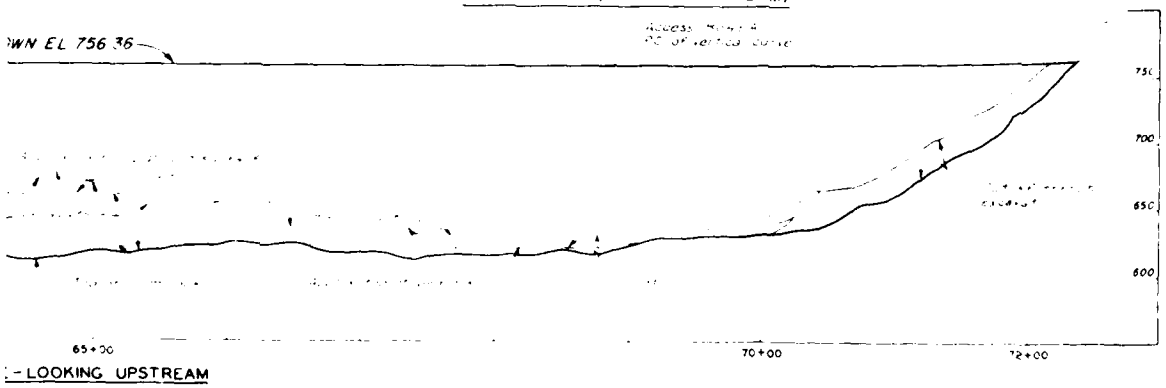
DAM AXIS PROFILE - LOOKING UPSTREAM



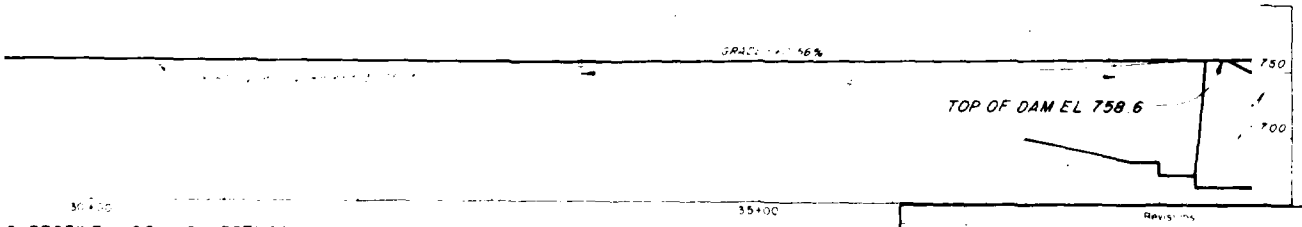
DAM AXIS PROFILE - LOOKING UPSTREAM



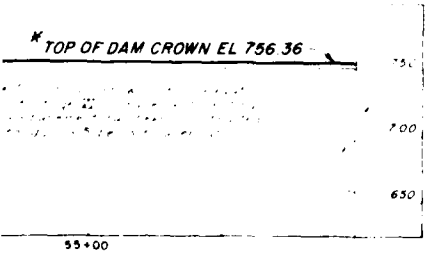
LEFT ABUTMENT UPSTREAM BLANKET DETAIL
RANGE 1+97 U (LOOKING UPSTREAM)



- LOOKING UPSTREAM



IS PROFILE - LOOKING UPSTREAM



DRAWINGS IN THIS FOLIO HAVE BEEN REDUCED TO ONE HALF THE ORIGINAL SCALE

Revisions
Symbol | Description | Date | Approved

US ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

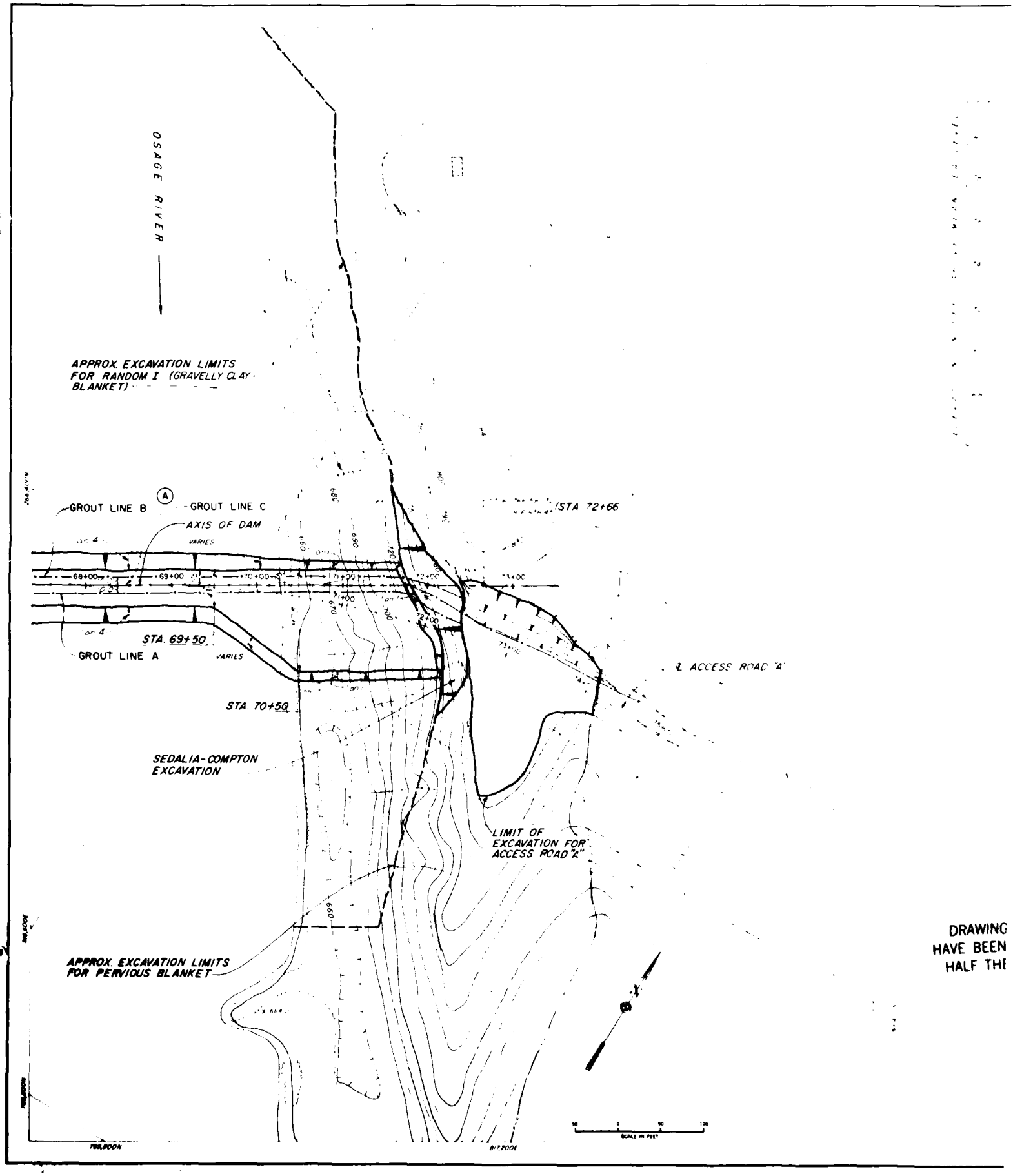
US Army Corps of Engineers

CONSTRUCTION FOUNDATION REPORT

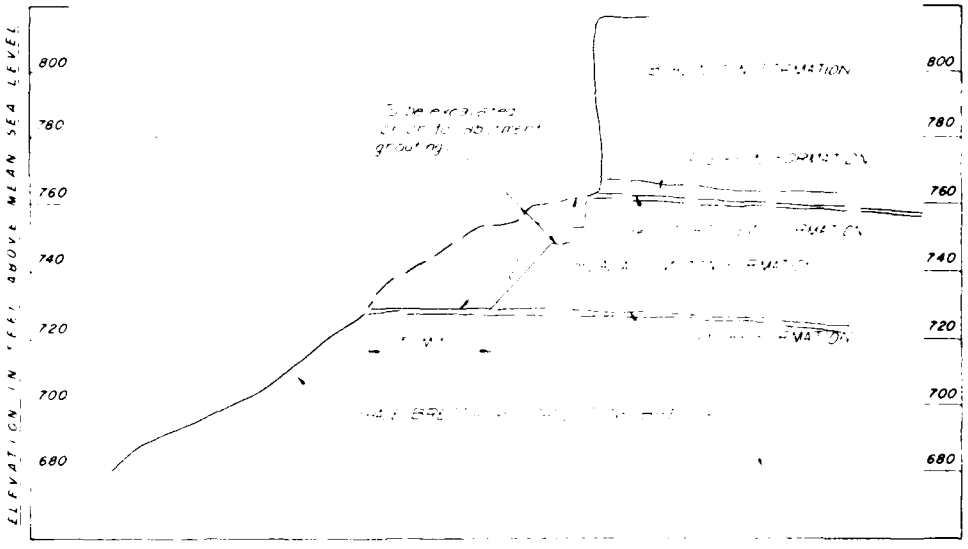
DIVERSION AND CLOSURE PROFILES

Scale
Date MARCH 1985
Drawing No.
Sheet Number
No. 0-12-9222

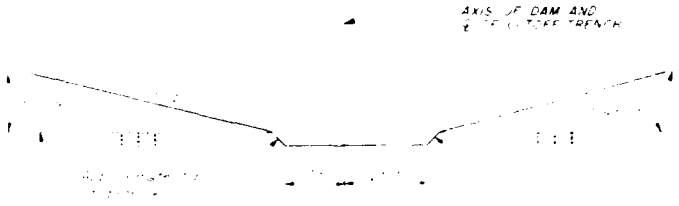
PLATE NO. 92



DRAWING
HAVE BEEN
HALF THE



SEDALIA - COMPTON FORMATION
EXCAVATION DETAIL



ROAD "A"

(A) CUTOFF TRENCH TYPICAL SECTION

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Symbol	Revisions Descriptions	Date	Approved

U. S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

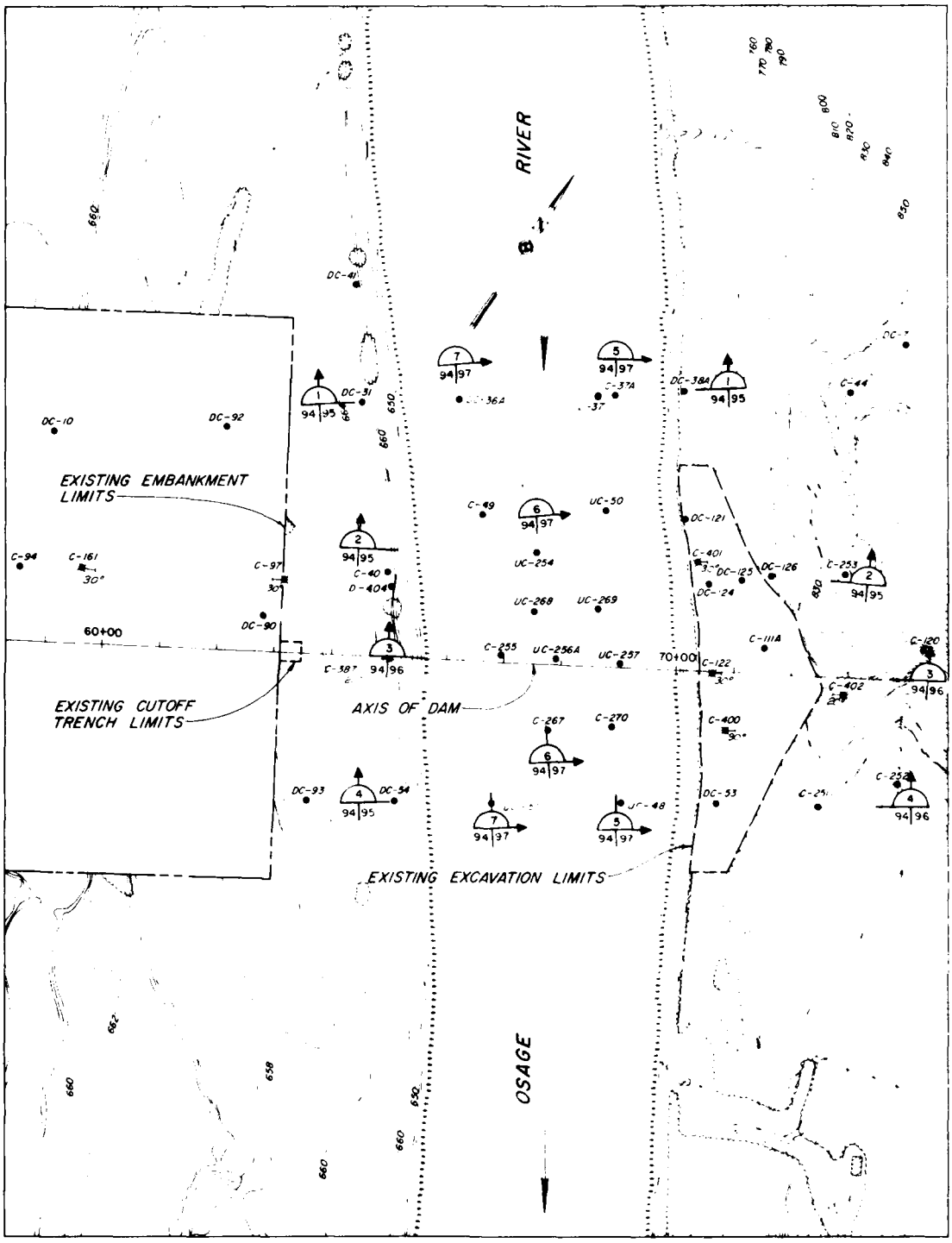
US Army Corps of Engineers

CONSTRUCTION FOUNDATION REPORT

LEFT ABUTMENT EXCAVATION
PLAN AND DETAILS

Scale: AS NOTED
Date: MARCH 1985
Sheet number
File No. 0-12-9223

PLATE NO 93



PLAN OF EXPLORATIONS
LEFT ABUTMENT & CLOSURE AREA

PLATE NUMBER WHERE SECTION IS CUT

SECTION IDENTI

DRAWINGS IN THIS FOLIO
HAVE BEEN REDUCED TO ONE
HALF THE ORIGINAL SCALE

Plate 4

SECTION NUMBER
PLATE NUMBER WHERE SECTION IS CUT — 2 — 94|97 — PLATE NUMBER WHERE SECTION IS DRAWN

SECTION IDENTIFICATION

Symbol	Revisions Descriptions	Date	Approved

U. S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

US Army Corps of Engineers

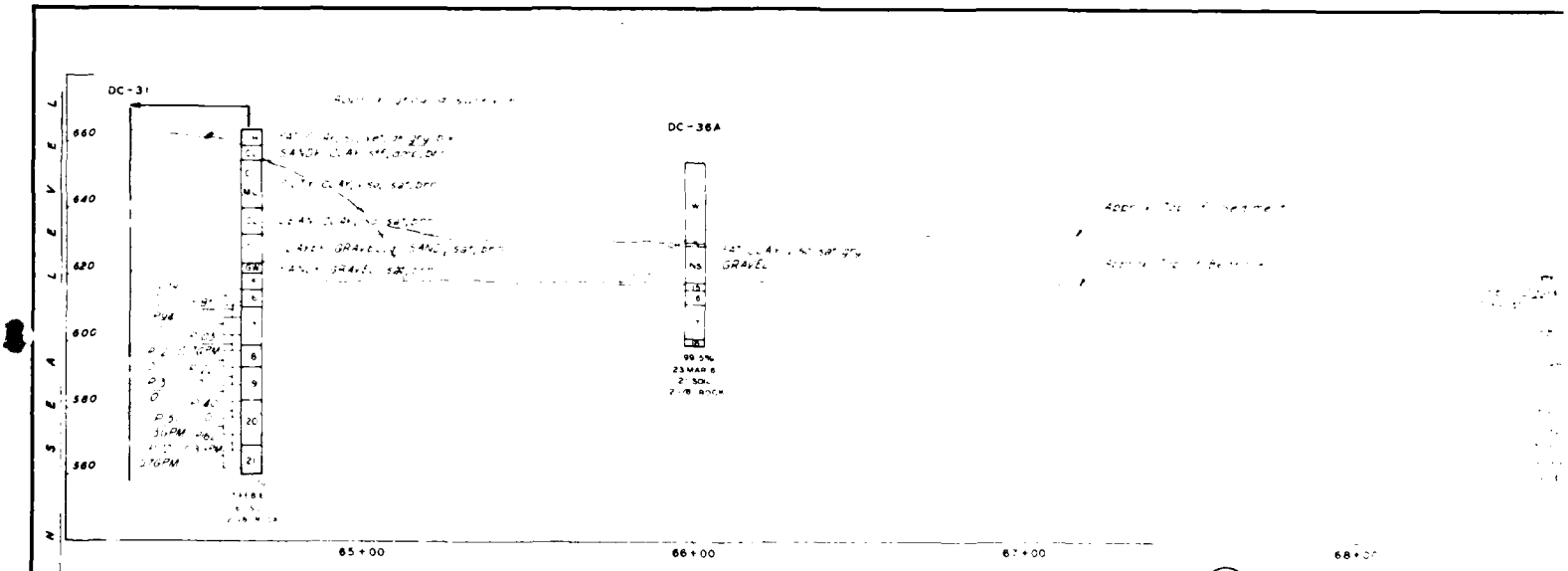
CONSTRUCTION FOUNDATION REPORT

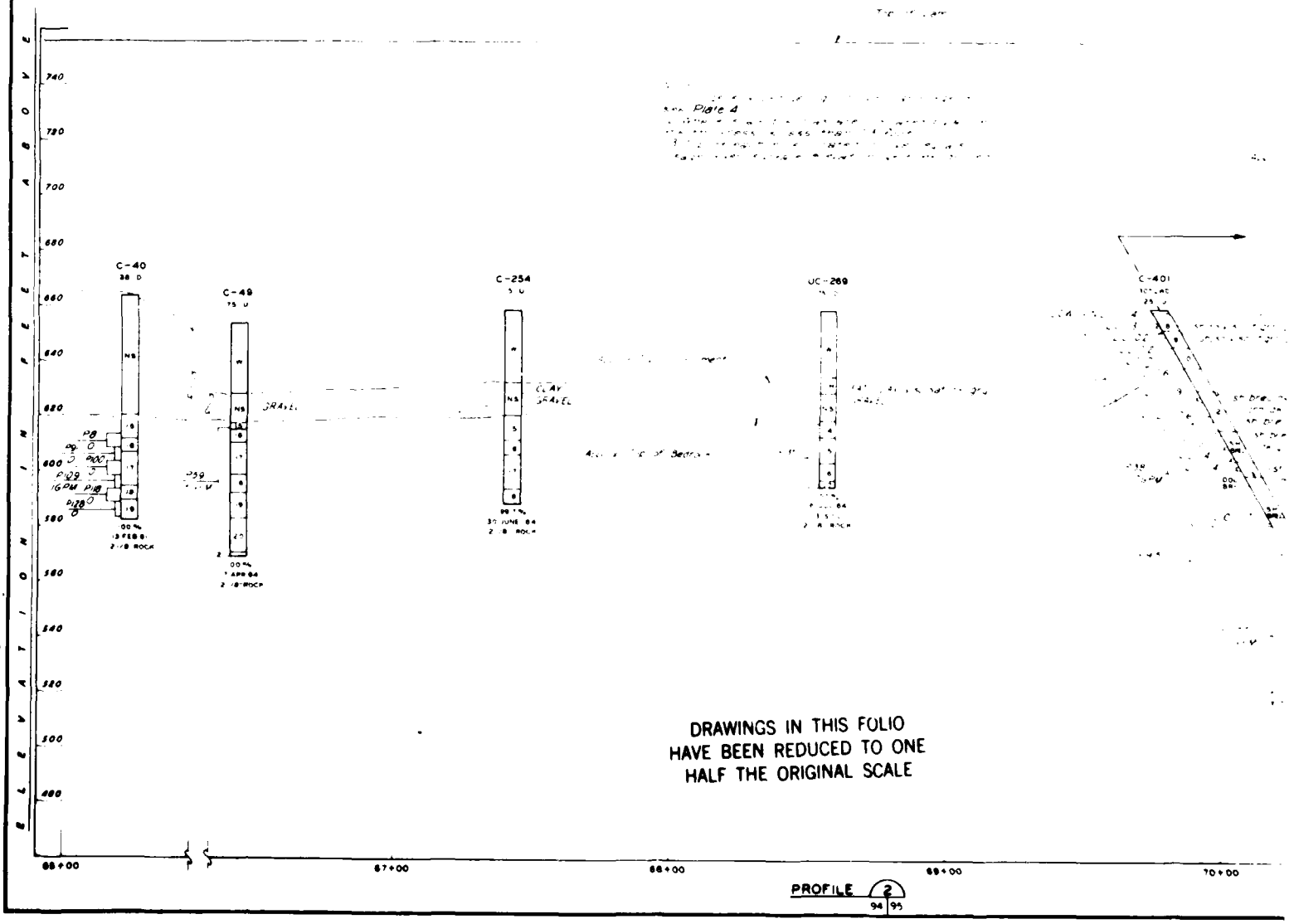
PLAN OF EXPLORATIONS
LEFT ABUTMENT AND CLOSURE

Designed by
Drawn by
Checked by
Submitted by

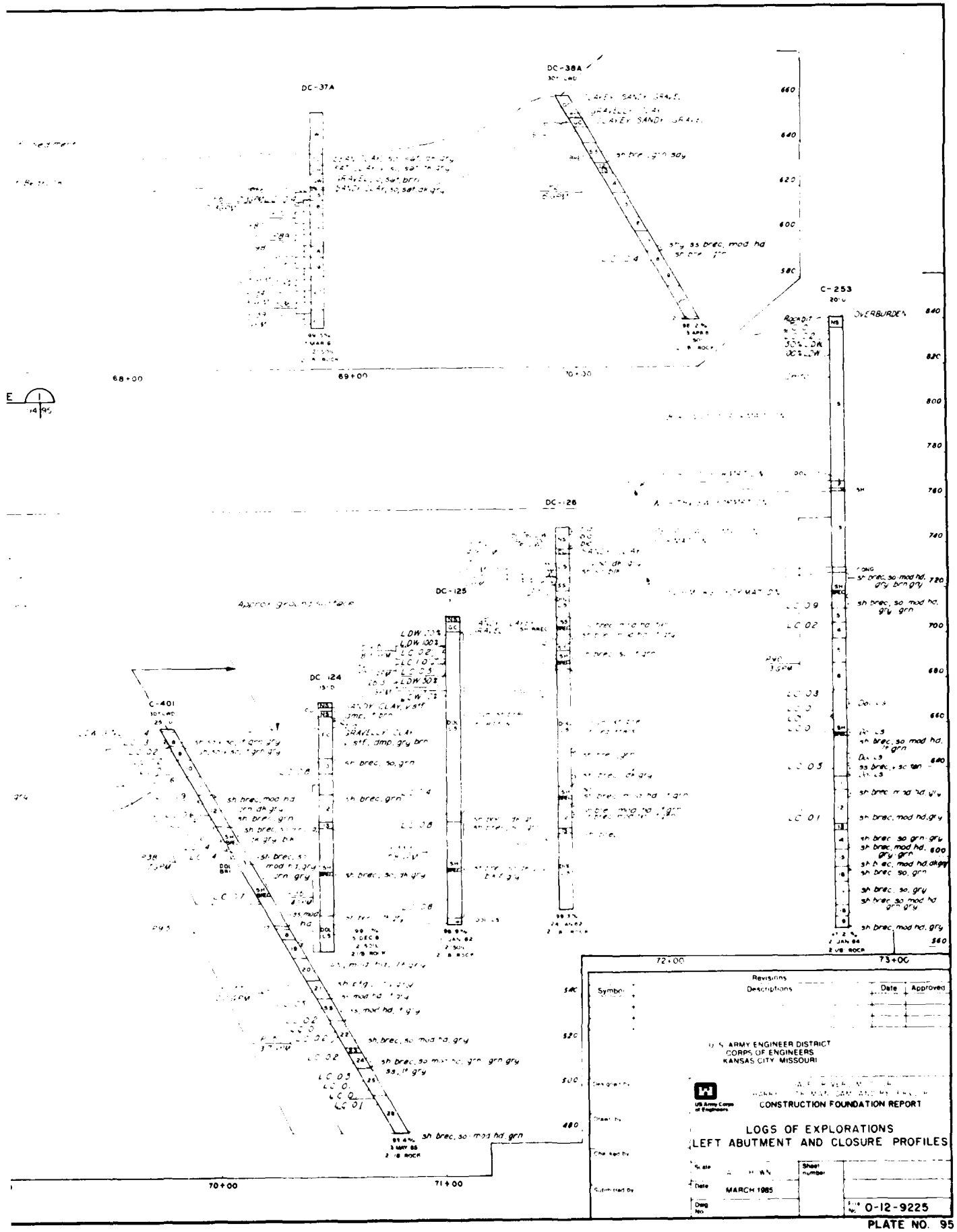
Scale
Date MARCH 1985
Dwg. No.
Sheet number

No. 0-12-9224





DRAWINGS IN THIS FOLIO
HAVE BEEN REDUCED TO ONE
HALF THE ORIGINAL SCALE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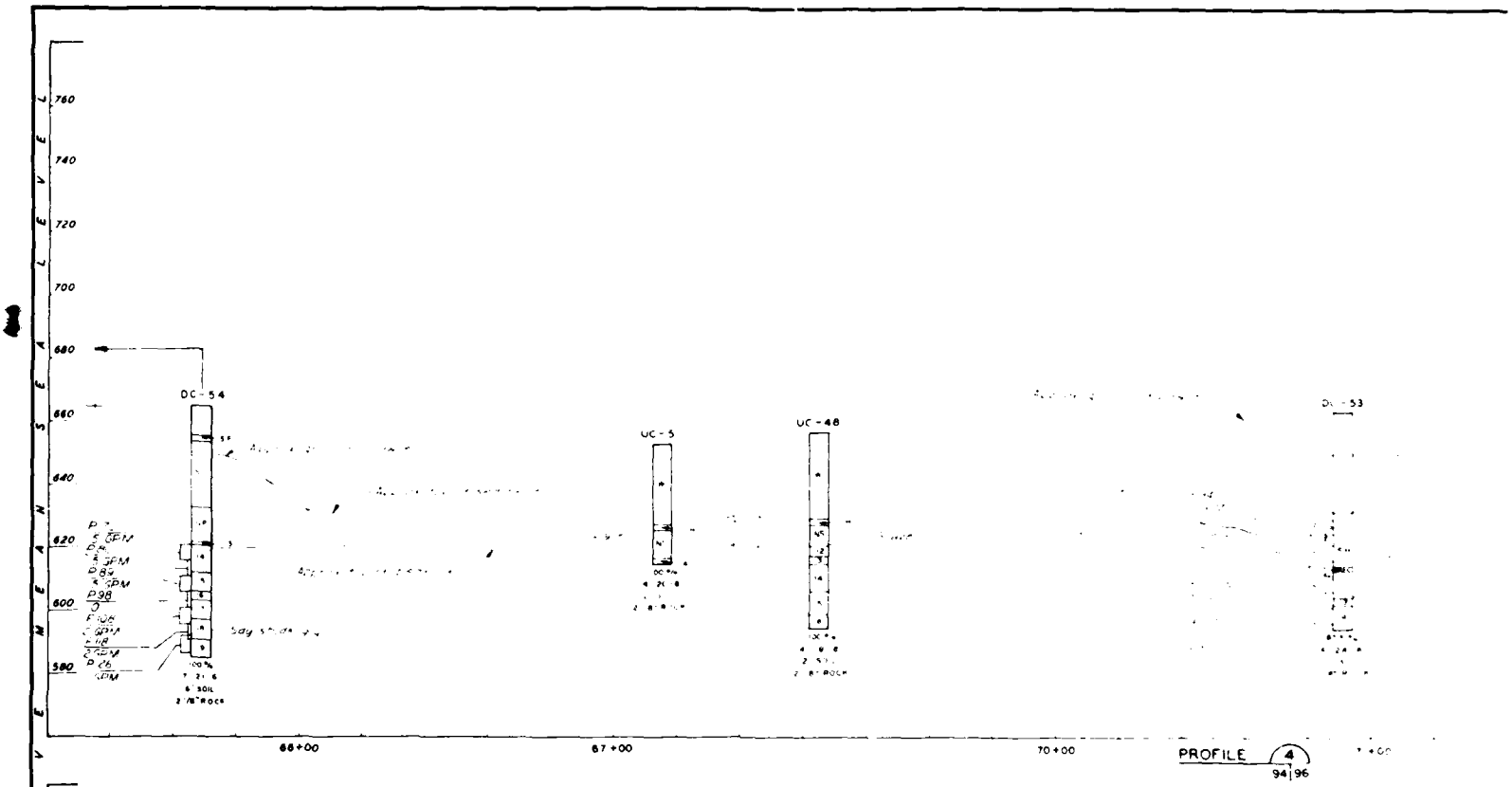
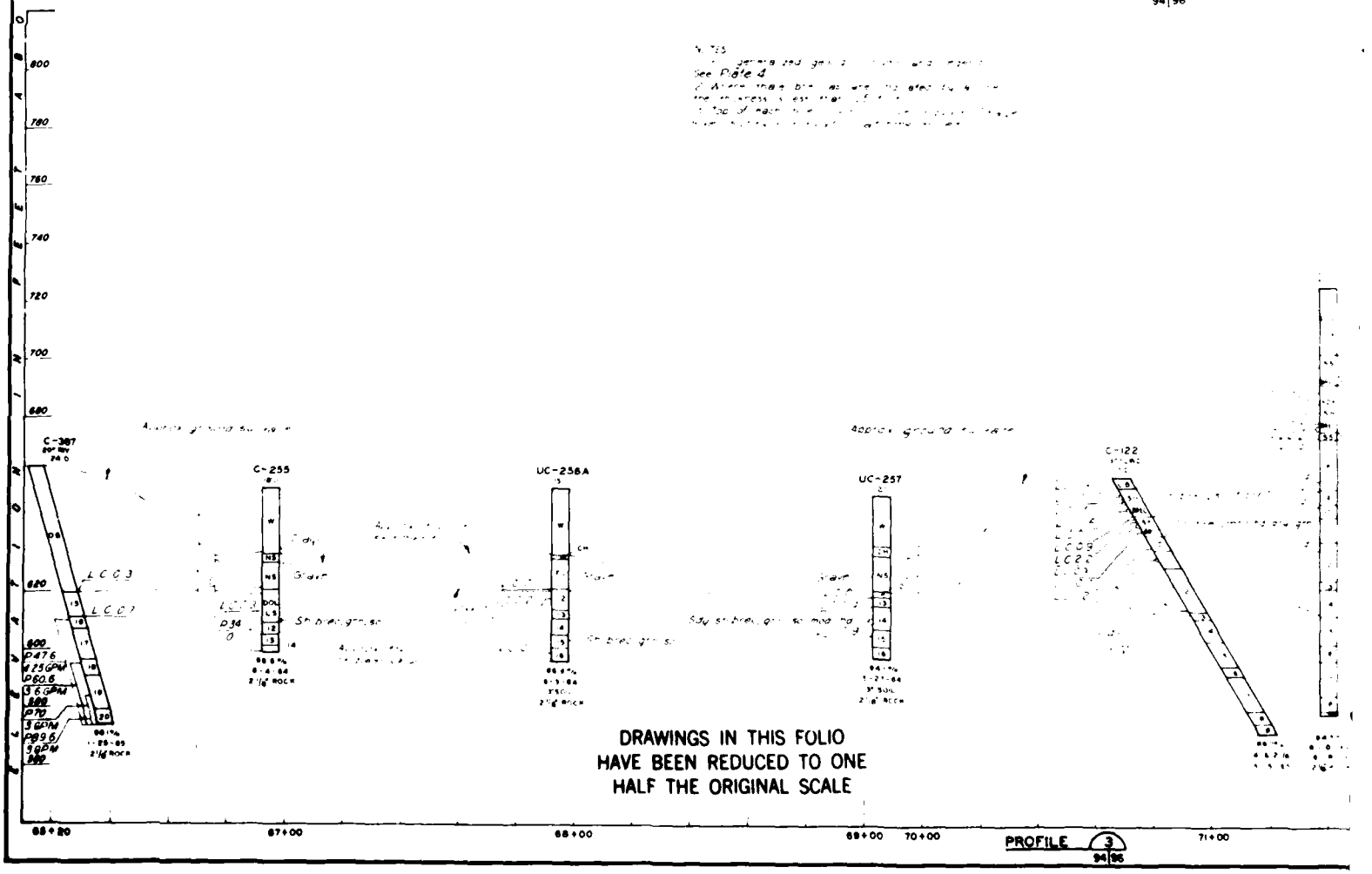
DC-38A
C-253
DC-126
DC-125
DC-124
C-401
OVERBURDEN
68+00
69+00
70+00
71+00
72+00
73+00
Revisions
Symbol
Descriptions
Date
Approved
U. S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY MISSOURI
CONSTRUCTION FOUNDATION REPORT
LOGS OF EXPLORATIONS
LEFT ABUTMENT AND CLOSURE PROFILES
MARCH 1985
0-12-9225

PLATE NO. 95





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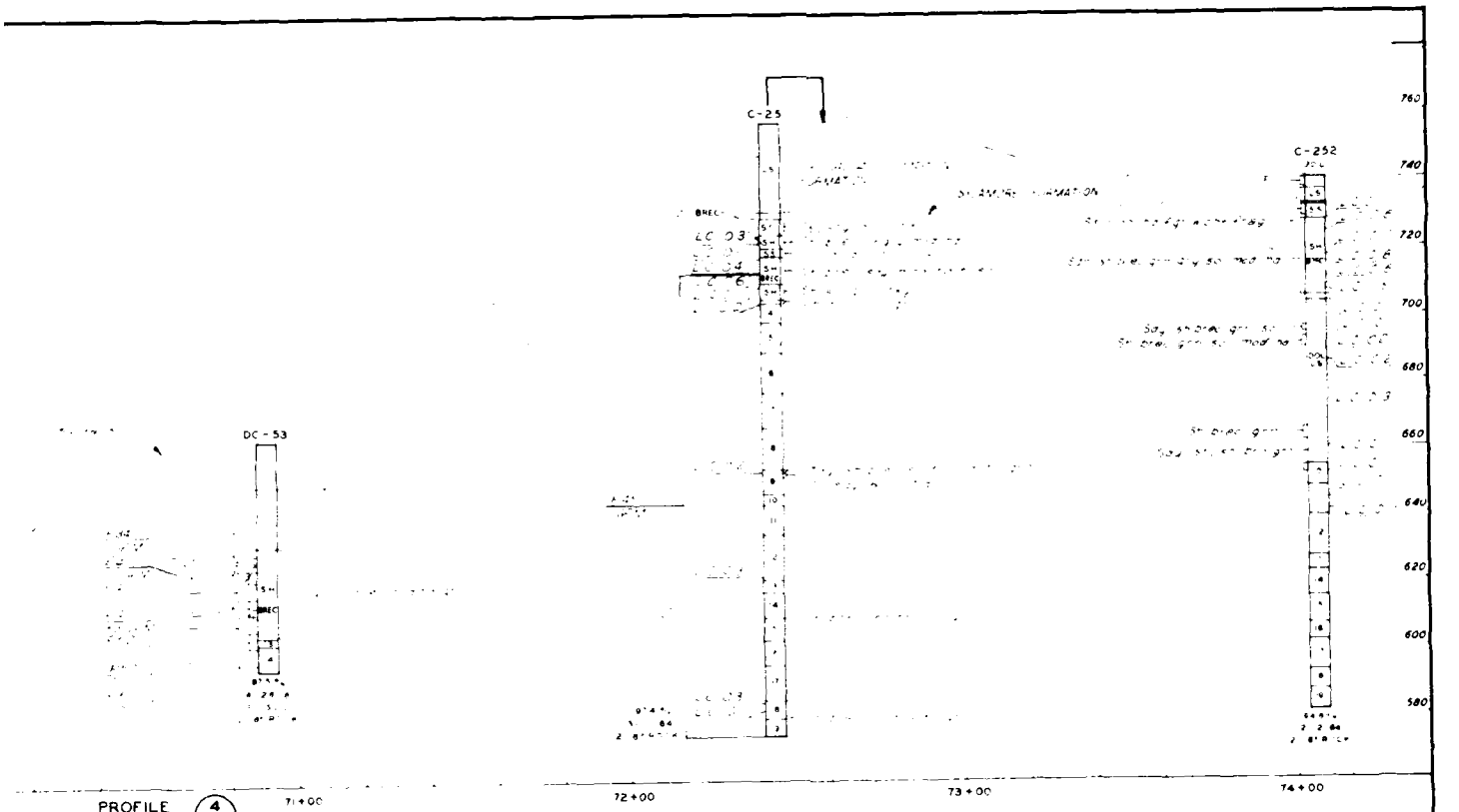

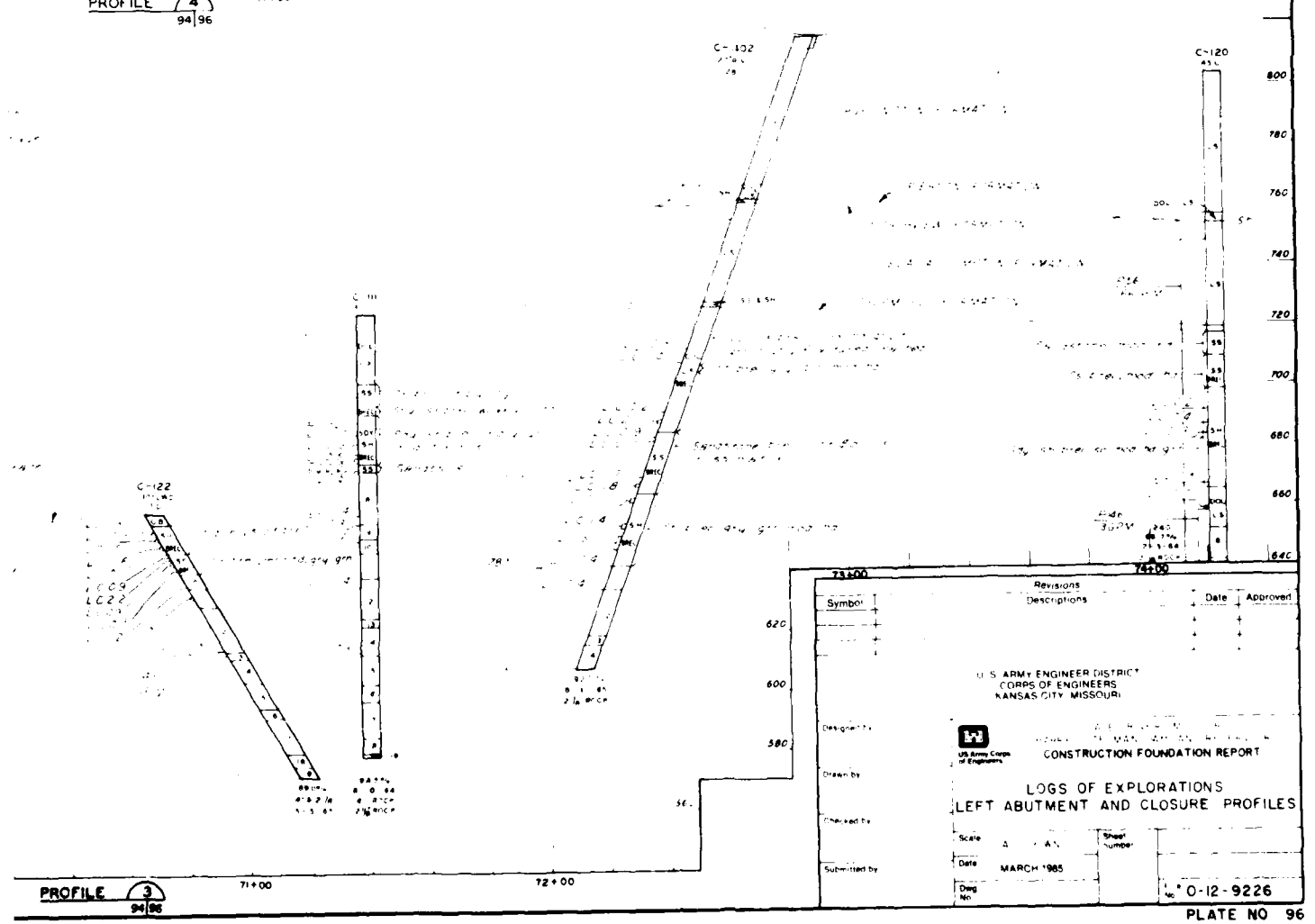

Symbol	Revisions Descriptions	Date	Approved

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

US Army Corps of Engineers

CONSTRUCTION FOUNDATION REPORT

LOGS OF EXPLORATIONS
LEFT ABUTMENT AND CLOSURE PROFILES

Designed by
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Date MARCH 1985
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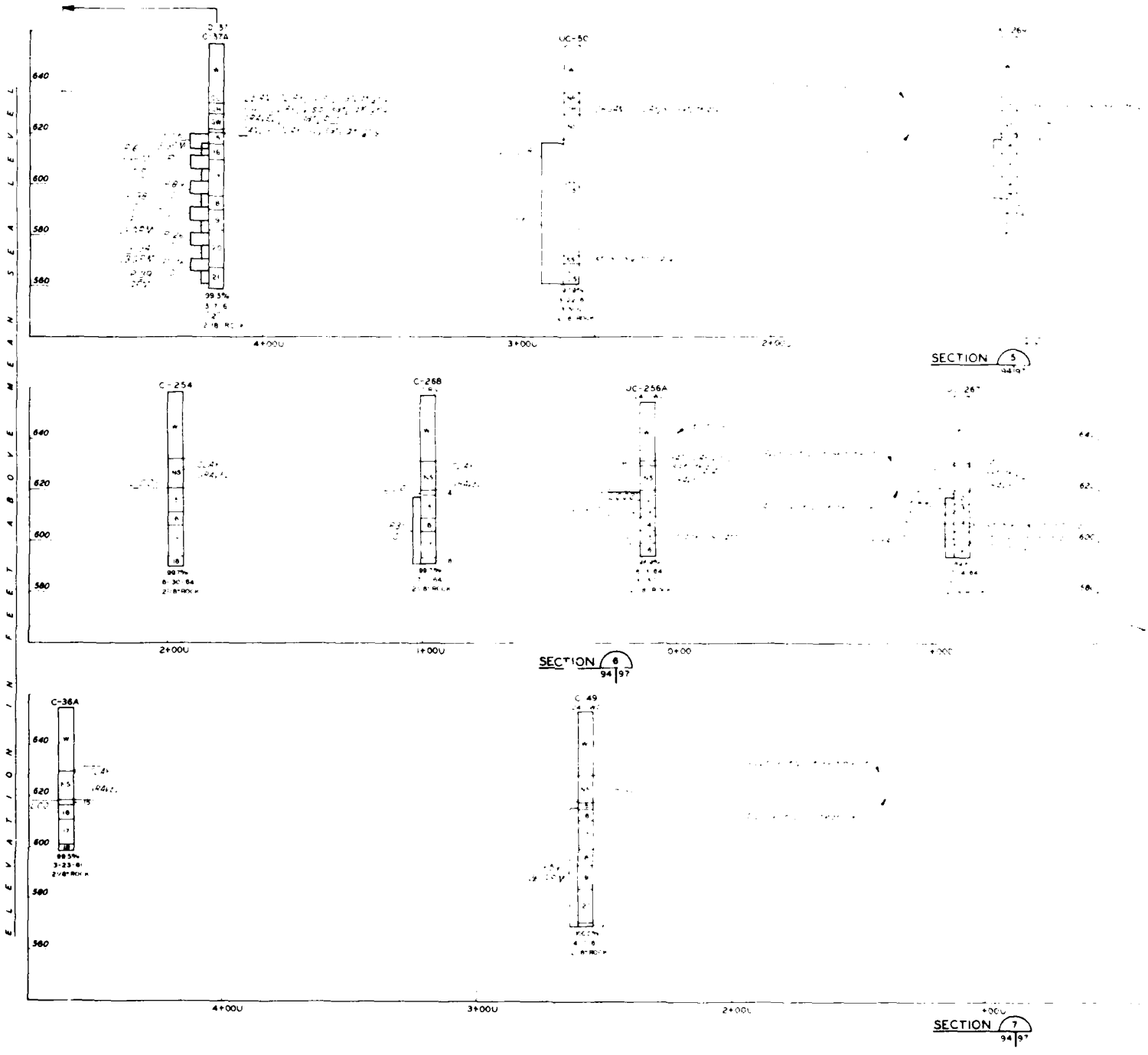
Sheet Number
No. 0-12-9226

PLATE NO 96



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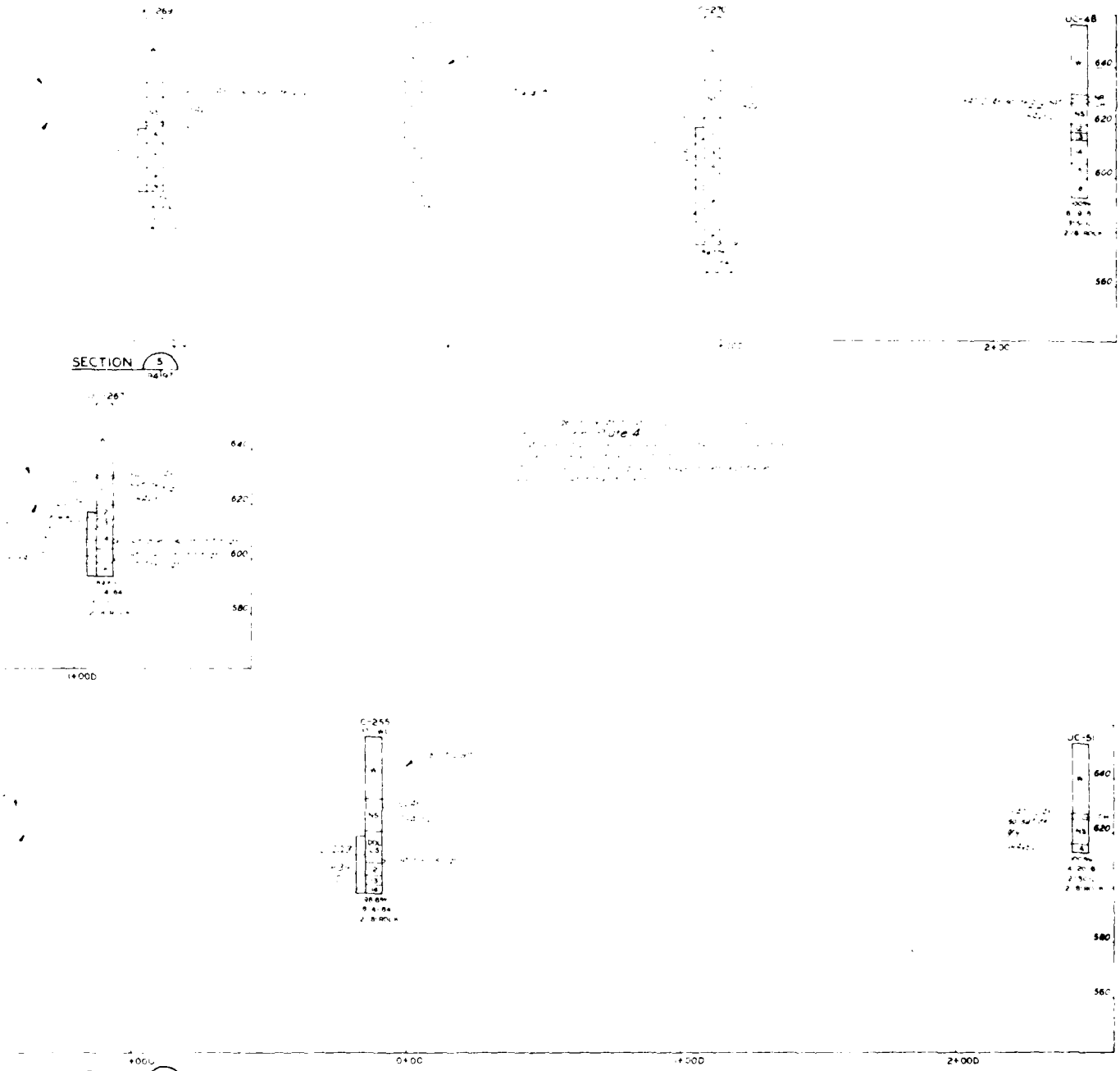

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HALF THE ORIGINAL SCALE

Symbol	Revisions Descriptions	Date	Approved

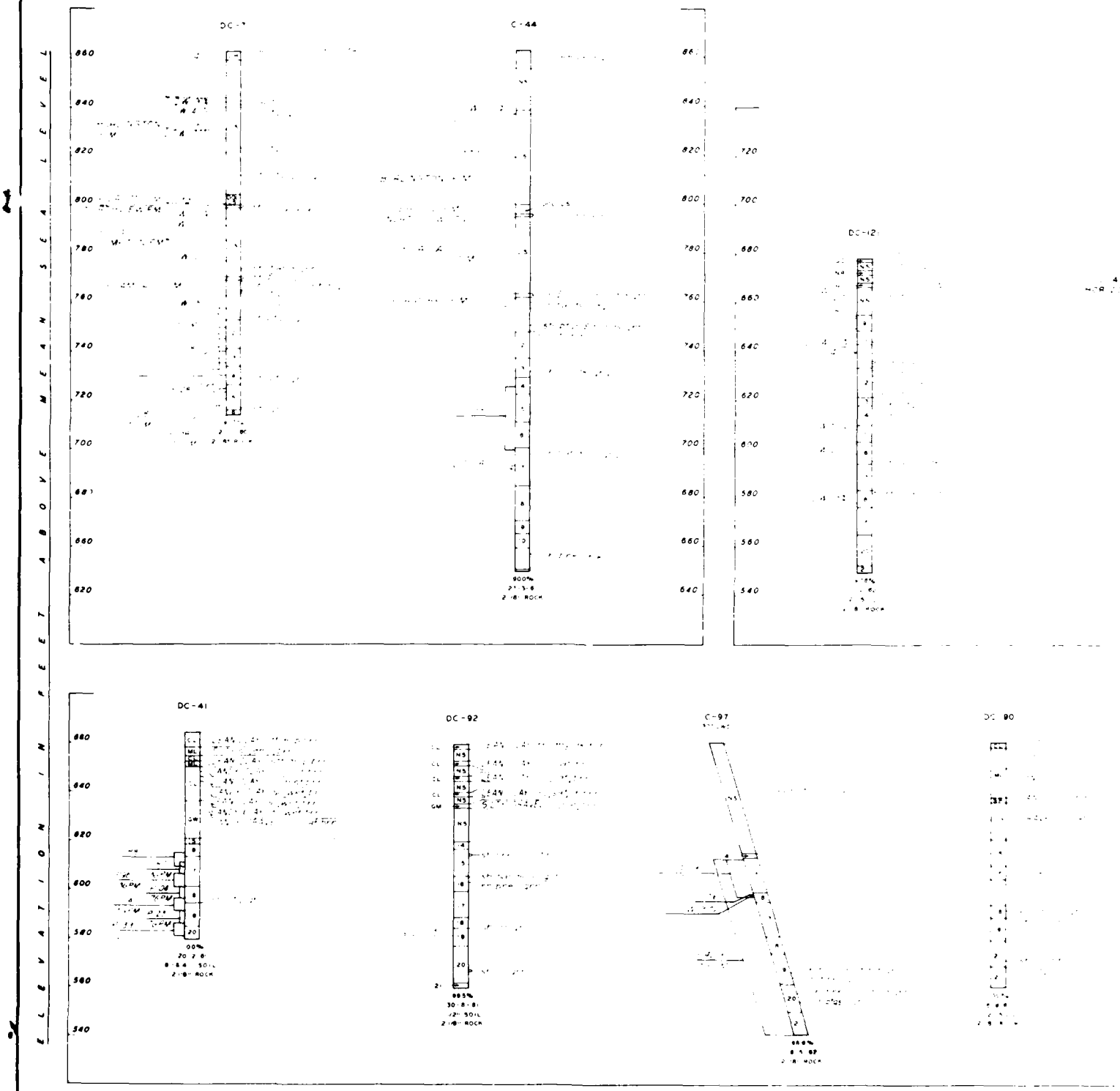
U. S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

US Army Corps of Engineers

CONSTRUCTION FOUNDATION REPORT

LOGS OF EXPLORATIONS
CLOSURE SECTIONS

Scale
Date MARCH 1985
Dwg No.
Sheet number
File No. 0-12-9227



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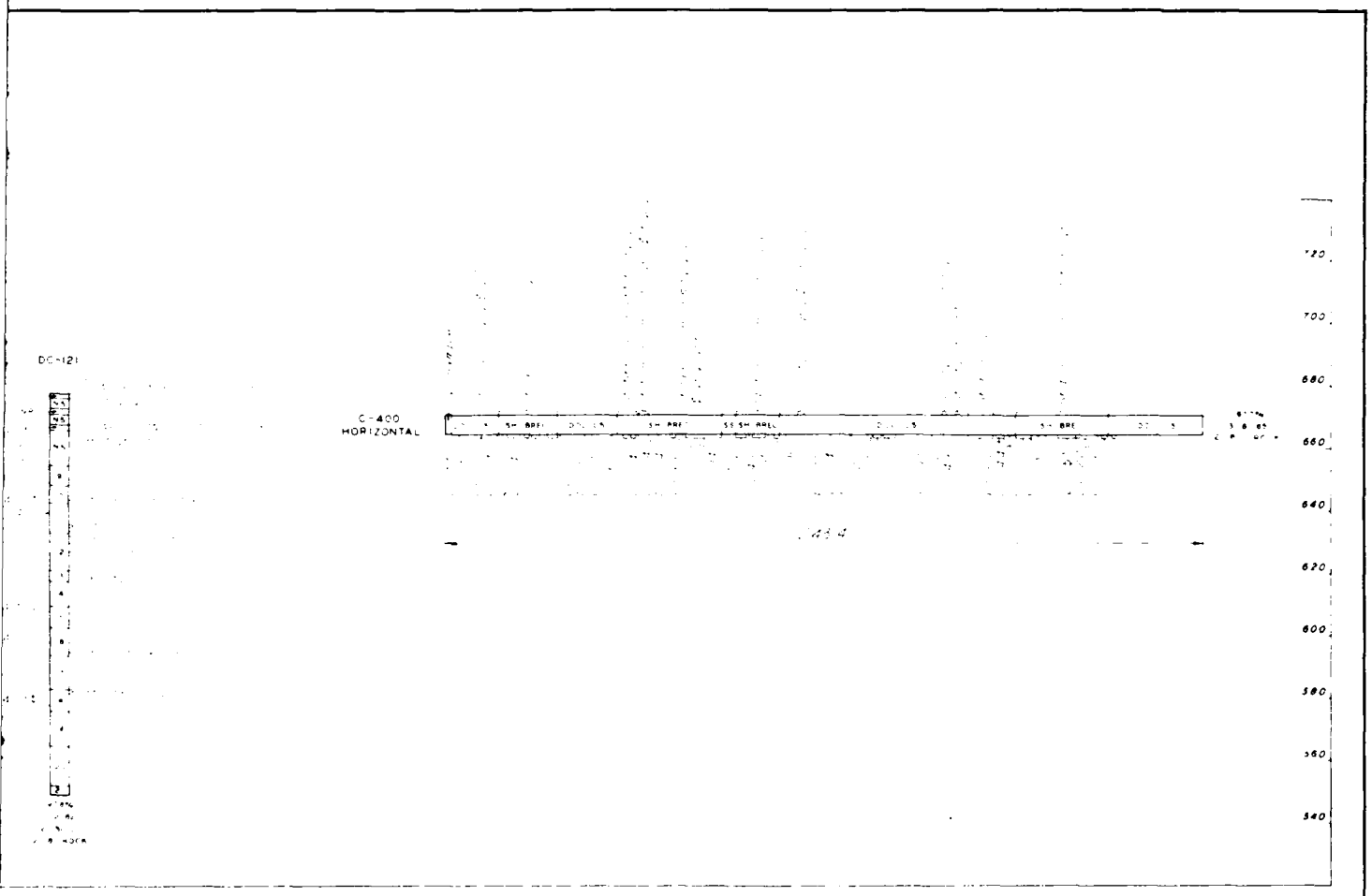
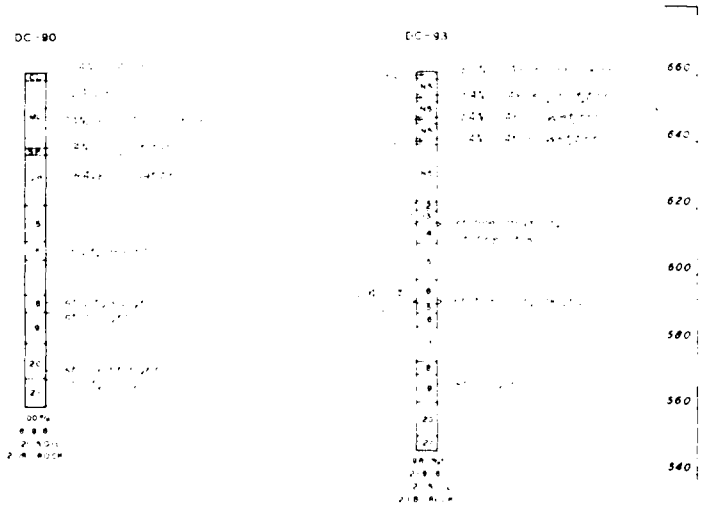




DRAWINGS IN THIS FOLIO HAVE BEEN REDUCED TO ONE HALF THE ORIGINAL SCALE

Revisions

Symbol	Description	Date	Approved

U. S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

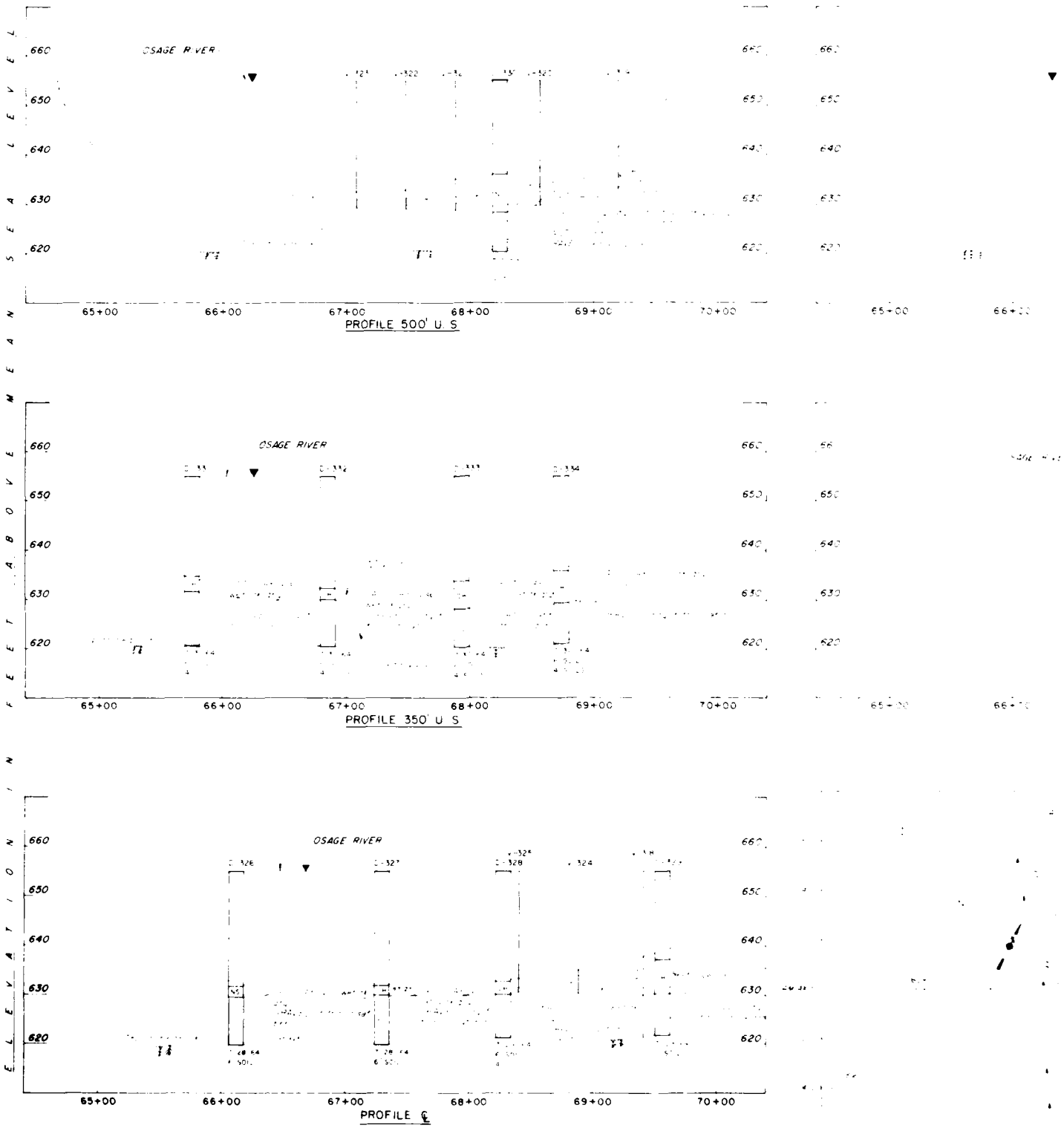
US Army Corps of Engineers

CONSTRUCTION FOUNDATION REPORT

LOGS OF EXPLORATIONS
LEFT ABUTMENT AND CLOSURE PROFILES
DETACHED BORINGS

Designed by
Drawn by
Checked by
Submitted by
Scale
Date MARCH 1985
Sheet number
Dwg No. 0-12-9228

PLATE NO 98



DRAWINGS IN THIS FOLIO
HAVE BEEN REDUCED TO ONE
HALF THE ORIGINAL SCALE

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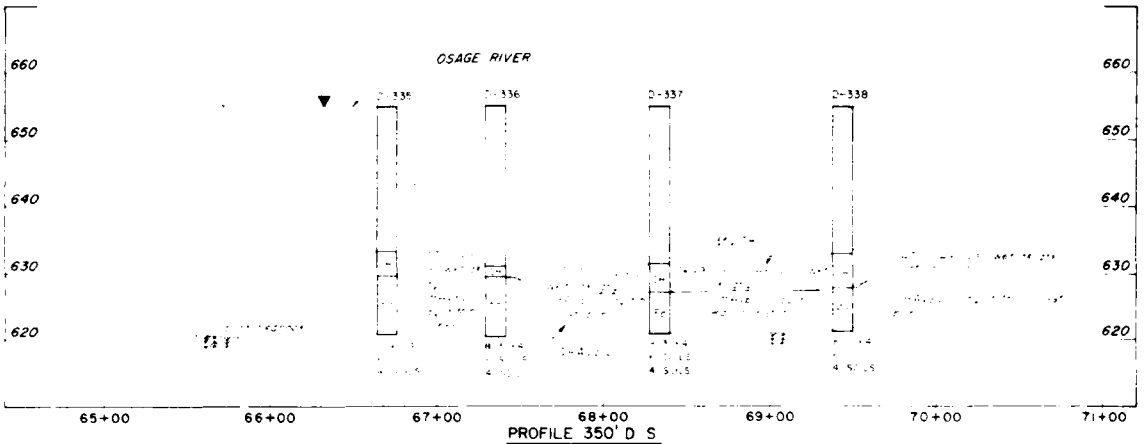
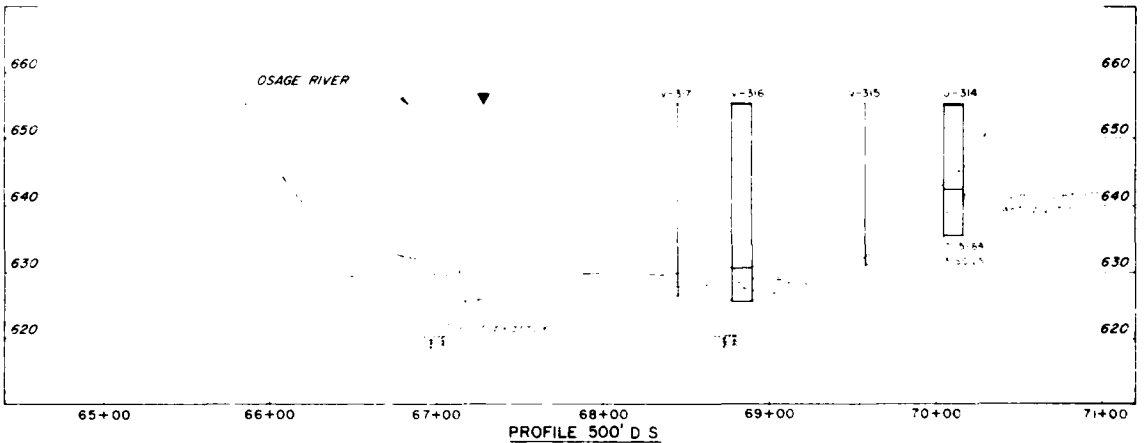
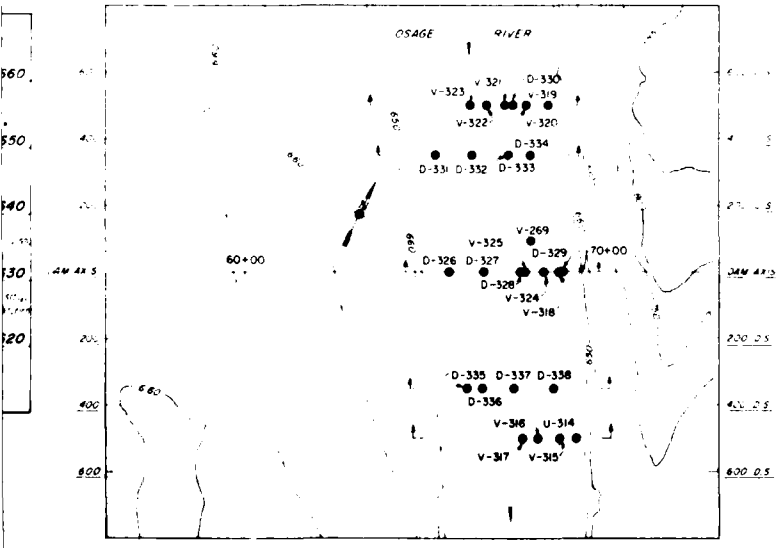


PROFILE 350' D S

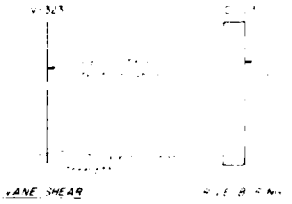


PROFILE 500' D S



PLAN

LEGEND



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U. S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

US Army Corps of Engineers

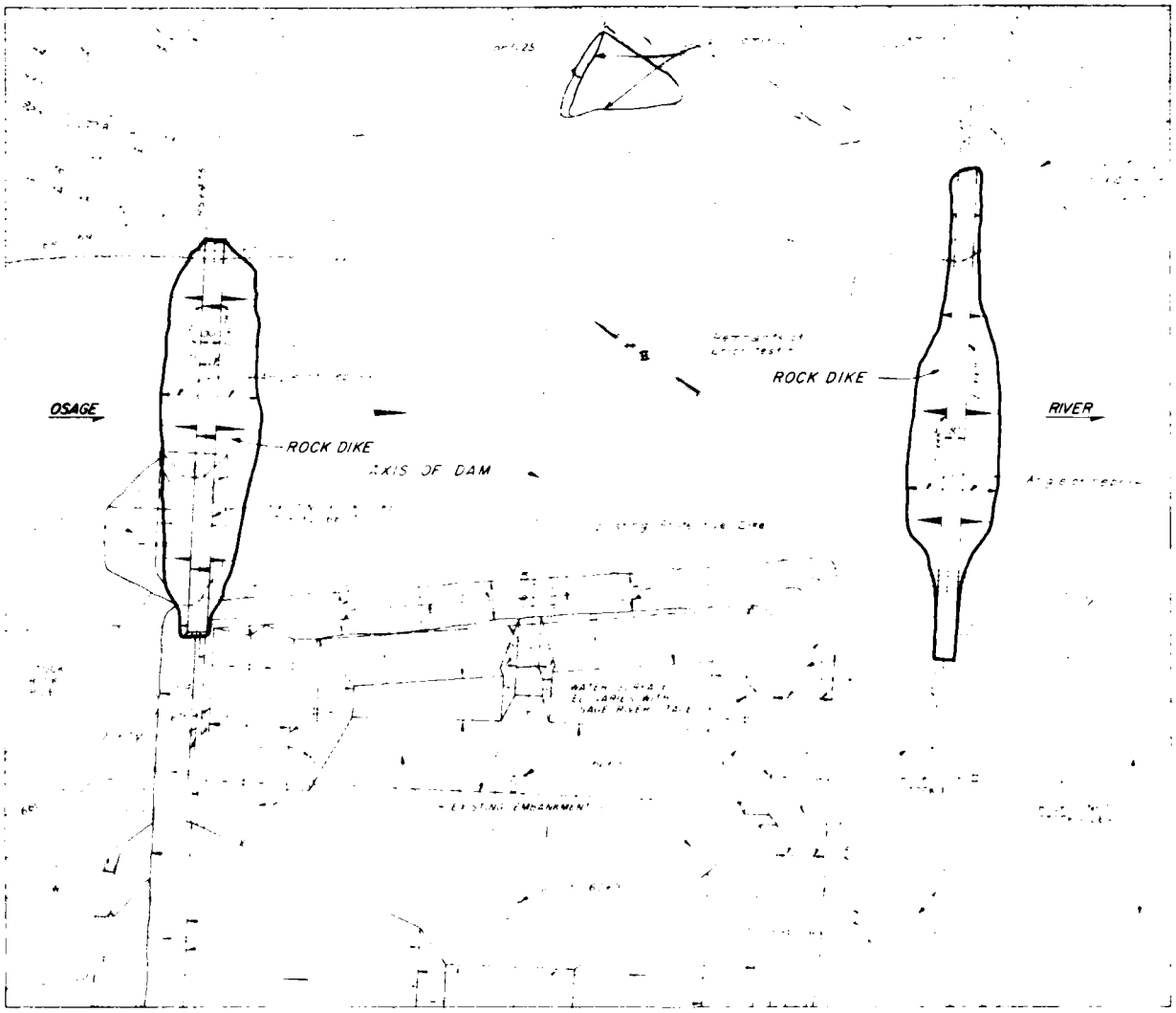
HARRY S. TRUMAN DAM AND RESERVOIR
CONSTRUCTION FOUNDATION REPORT

RIVER CHANNEL BORING
LAYOUT AND PROFILES

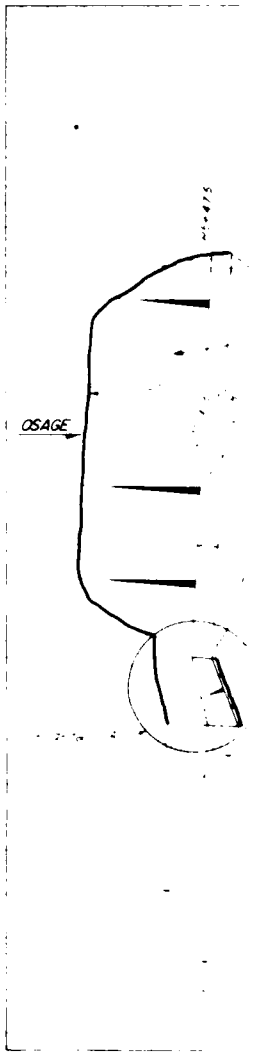
Designed by
Drawn by
Checked by
Submitted by

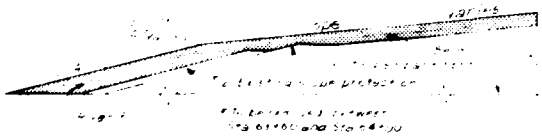
Scale: AS SHOWN
Date: MARCH 1985
Dwg No.
Sheet number
File No. 0-12-9229

PLATE NO. 99

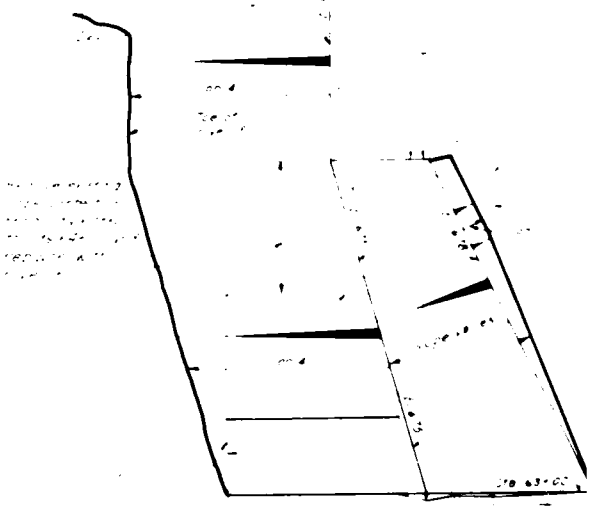


STEP I
PLACEMENT OF ROCK DIKES





STA. 63+00 TO STA. 64+00
DETAIL "B"



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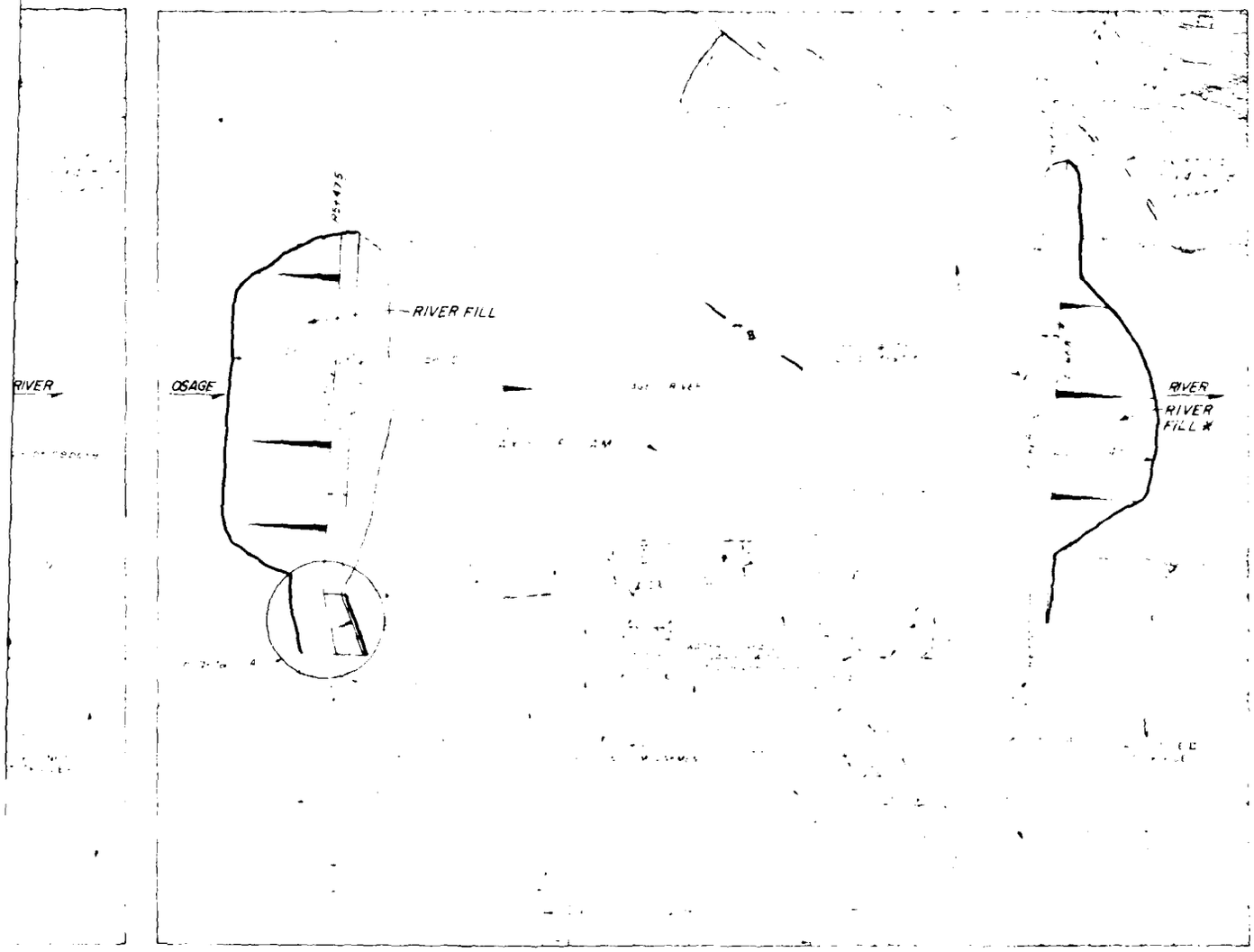
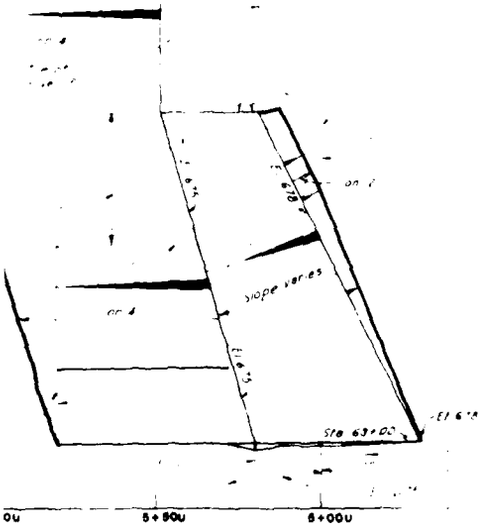


STEP 2
PLACEMENT OF RIVER FILL



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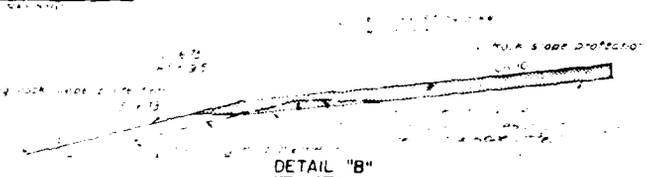

DETAIL "B"
EXISTING EMBANKMENT TO STA 63+00

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* closure area to be dewatered after placement of river fill

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US ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

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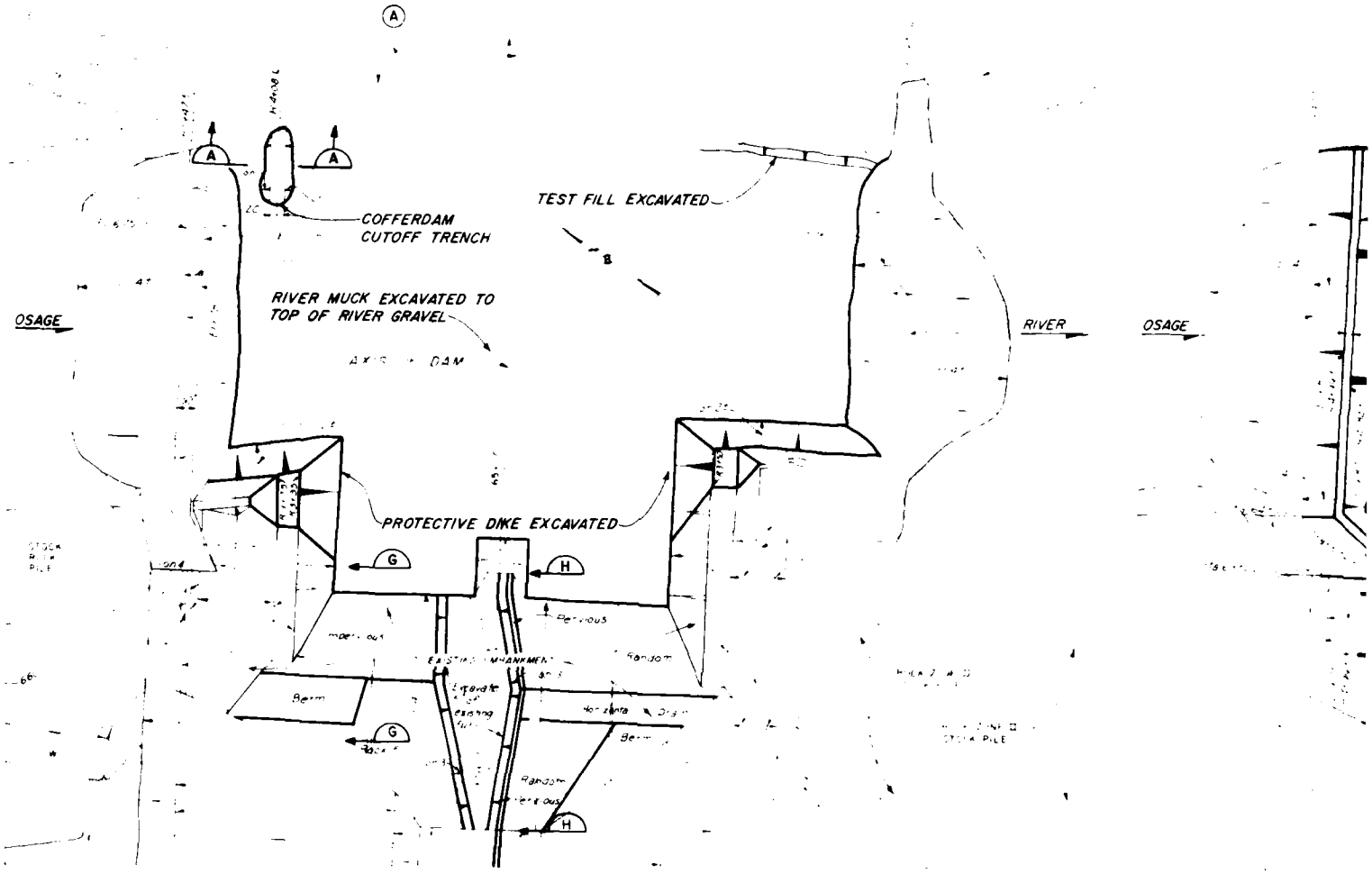
CONSTRUCTION FOUNDATION REPORT

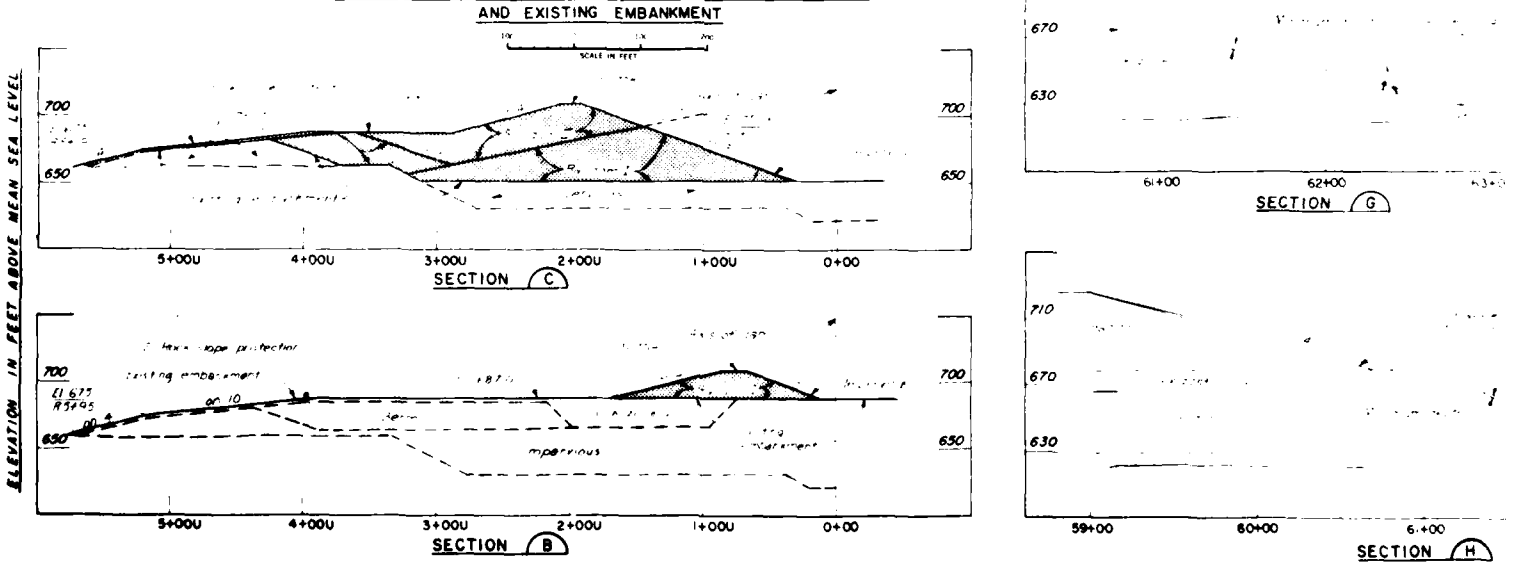
DIVERSION AND CLOSURE
PHASE 2

Scale
Sheet number
Date MARCH 1985
Dwg No. 0-12-9230

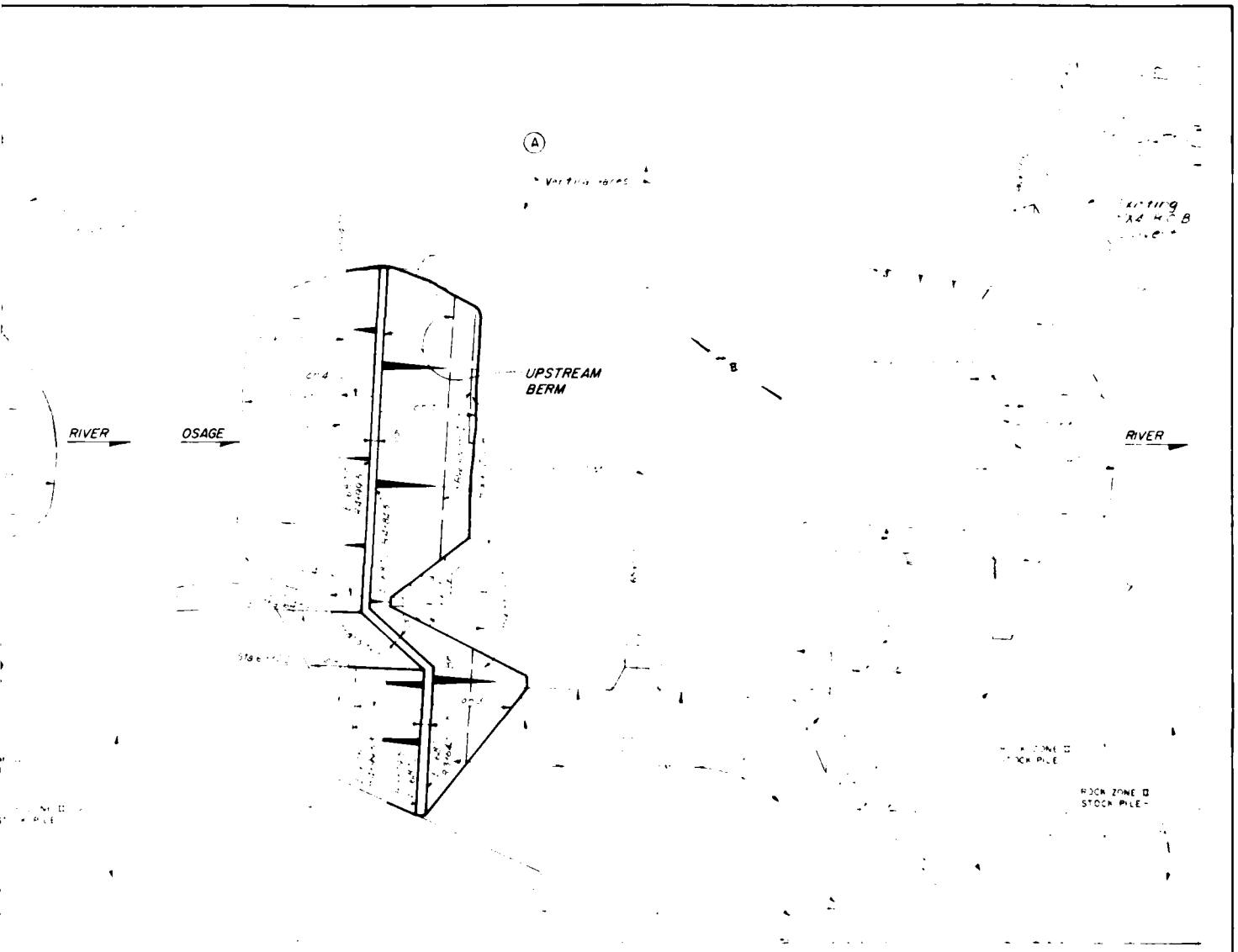
PLATE NO 100

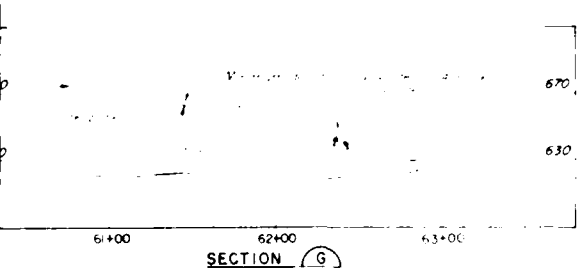


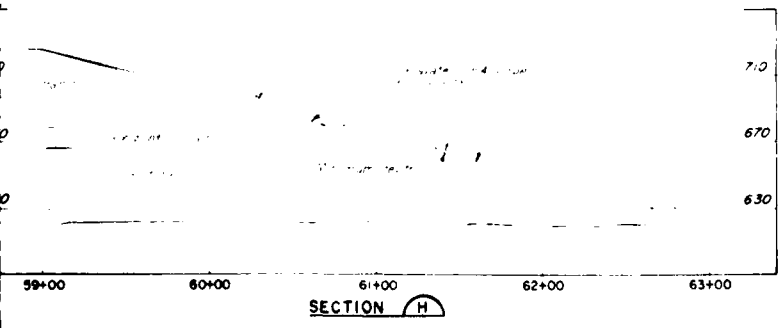
STEP I
EXCAVATION OF RIVER BOTTOM, AND PROTECTIVE DIKE,
AND EXISTING EMBANKMENT



COFFERDAM SECTIONS







SECTION A

COFFERDAM CUTOFF TRENCH

Symbol	Revisions Descriptions	Date	Approved

U. S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

US Army Corps of Engineers

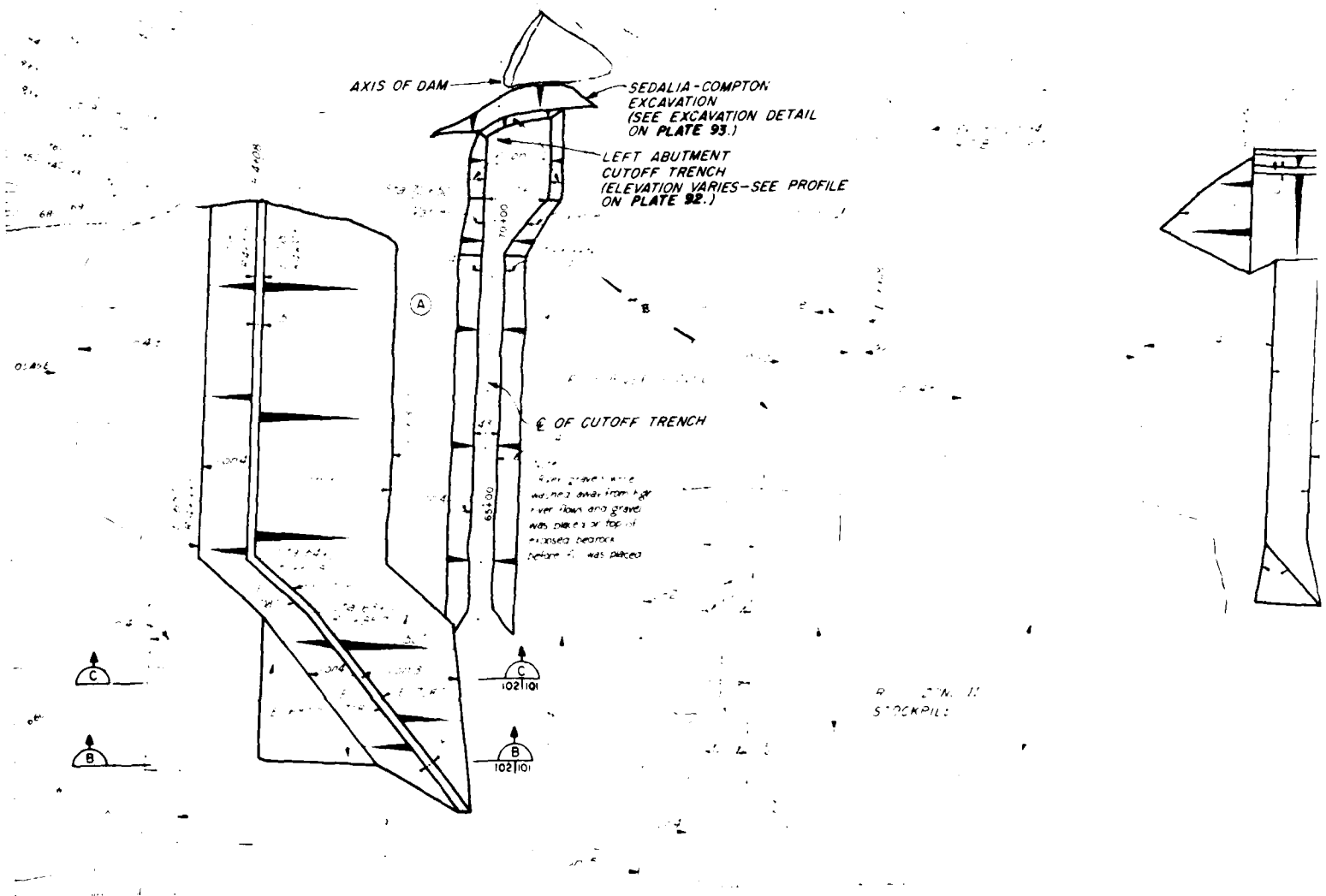
CONSTRUCTION FOUNDATION REPORT

DIVERSION AND CLOSURE
PHASE 3

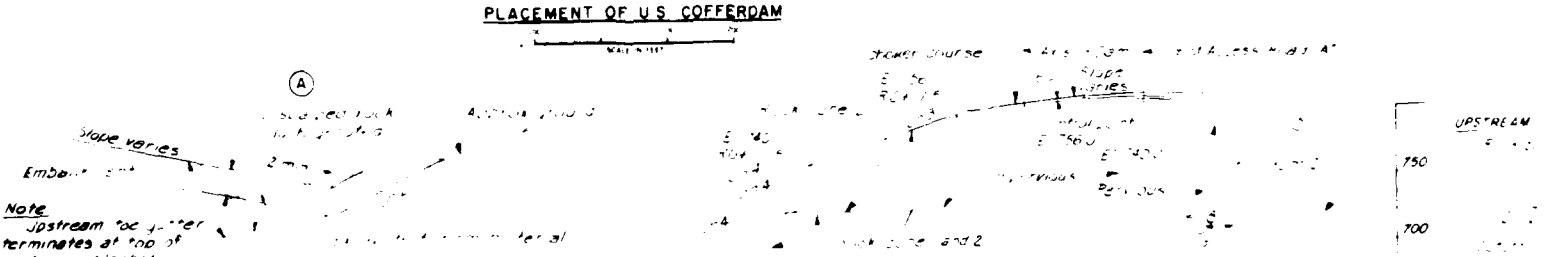
Designed by
Drawn by
Checked by
Submitted by

Scale: AS SHOWN
Date: MARCH 1985
Drwg No.: 0-12-9231

PLATE NO. 101

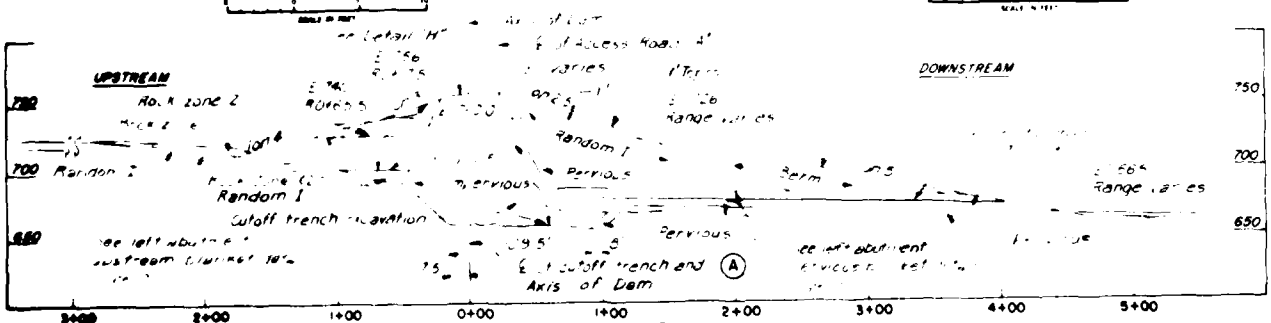


STEP 1
PLACEMENT OF U.S. COFFERDAM

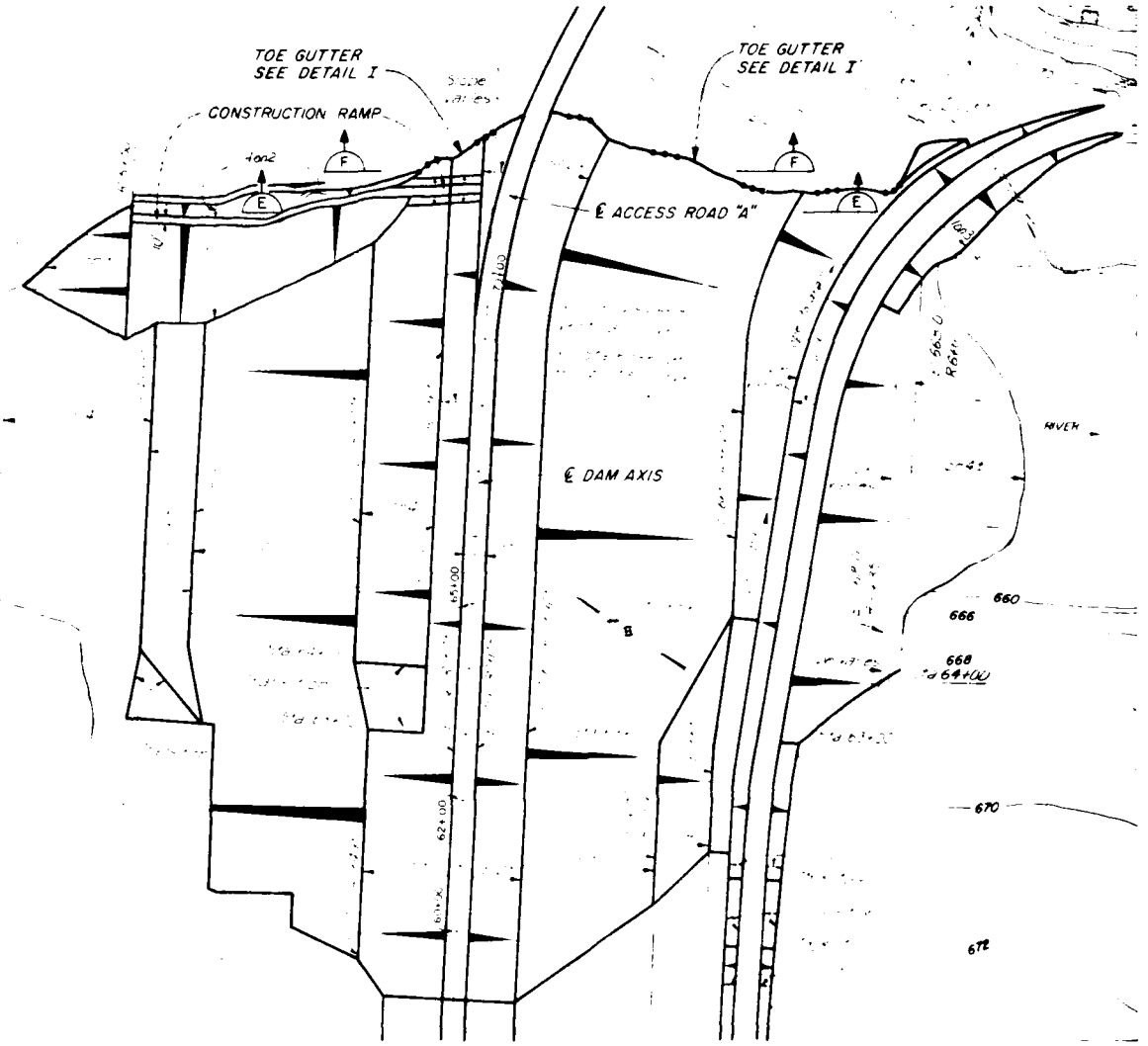


DETAIL "1"
LEFT ABUTMENT TOE GUTTER

DETAIL "H"

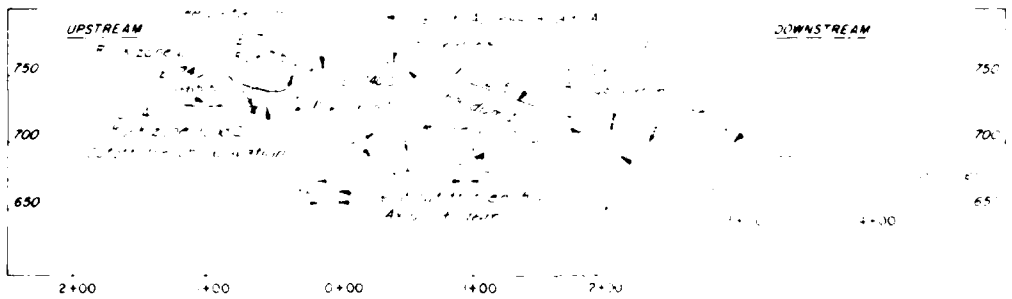


LEFT ABUTMENT SECTION (E)



STEP 2
COMPLETION OF EMBANKMENT

DRAWINGS IN THIS FOLIO HAVE BEEN REDUCED TO ONE HALF THE ORIGINAL SCALE



LEFT ABUTMENT SECTION (F)

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

US Army Corps of Engineers

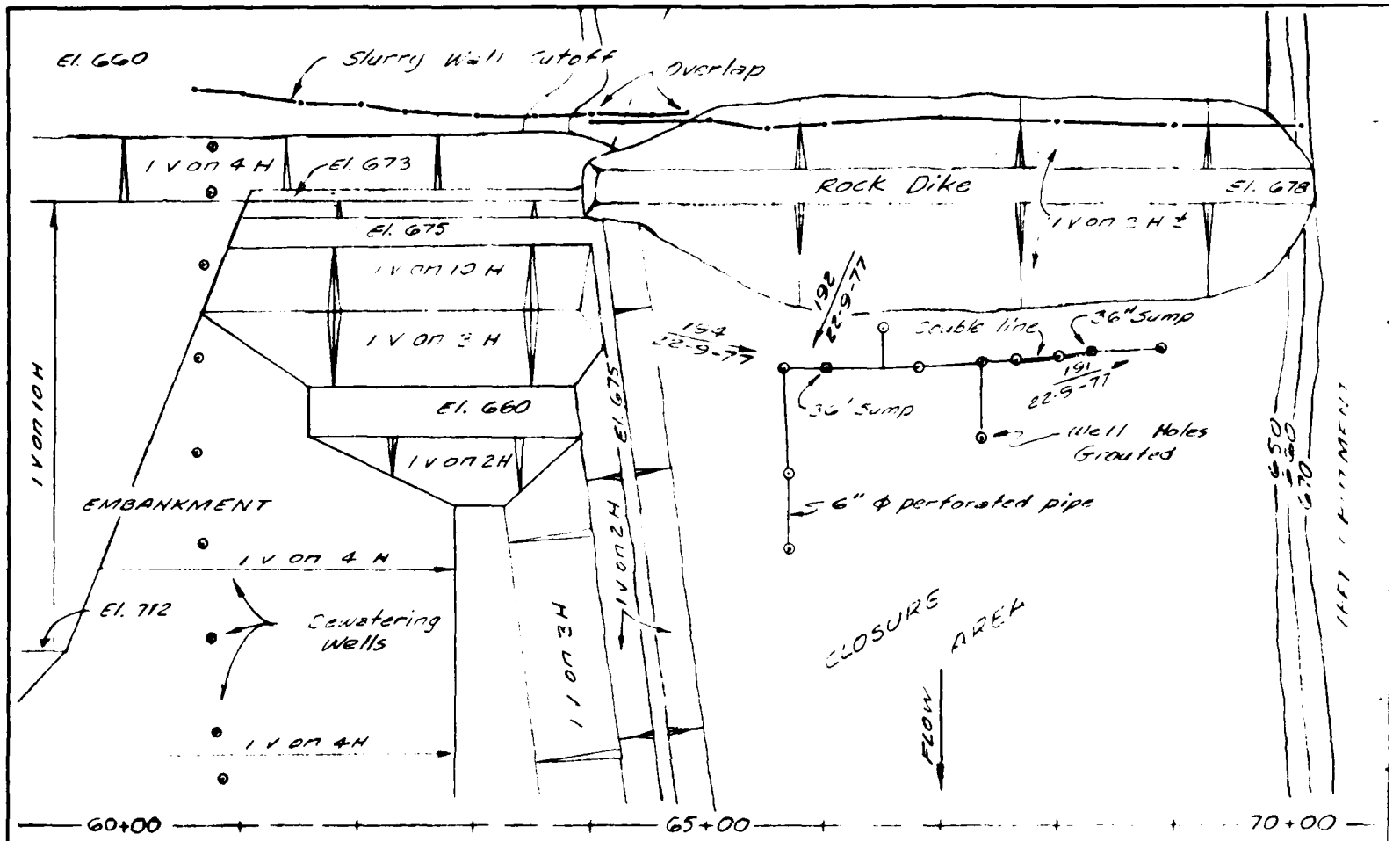
CONSTRUCTION FOUNDATION REPORT

DIVERSION AND CLOSURE
PHASE 4

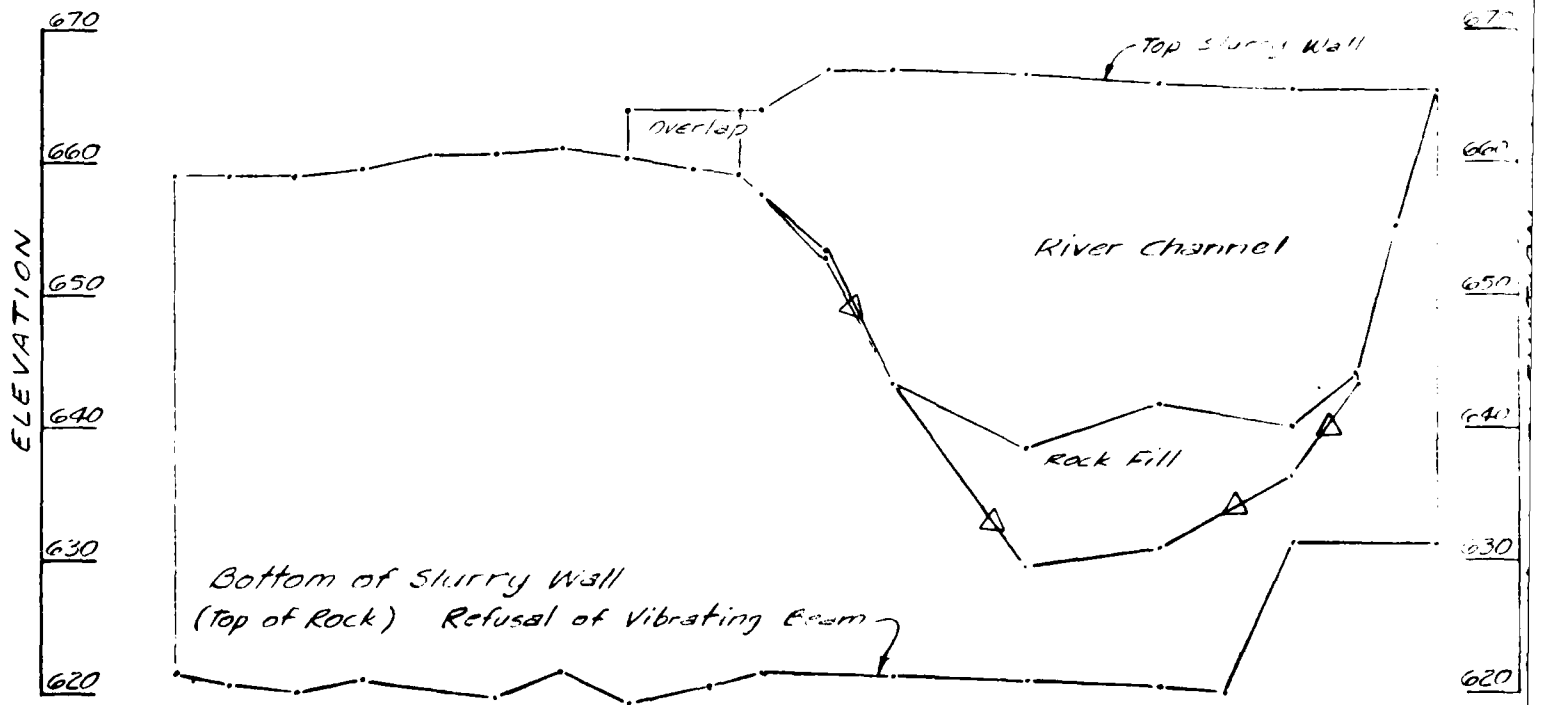
Scale: AS SHOWN
Date: MARCH 1985
Sheet number:
No. 0-12-9232

Symbol	Revisions Descriptions	Date	Approved

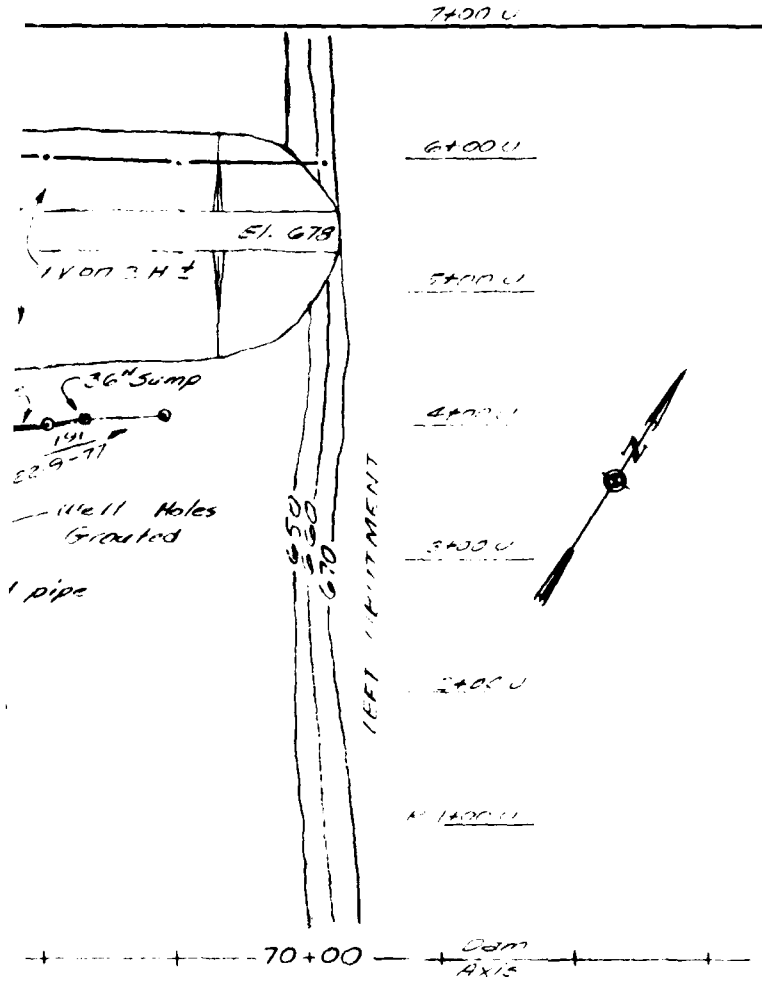
PLATE NO 102



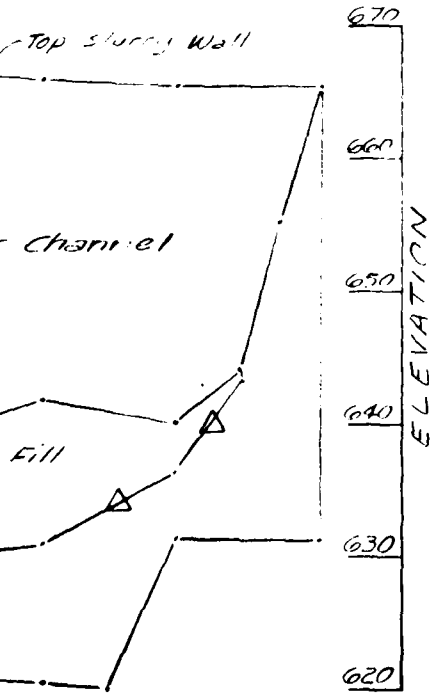
PLAN UPSTREAM DEWATERING COLLECTOR SYSTEM AND SL



PROFILE UPSTREAM SLURRY WALL



SYSTEM AND SLURRY WALL CLOSURE AREA



191 / 22-9-77 Direction Date & Number of Photo

△ Prominant Seepage Points

0 100
SCALE IN FEET

Revisions			
Symbol	Descriptions	Date	Approved

U. S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

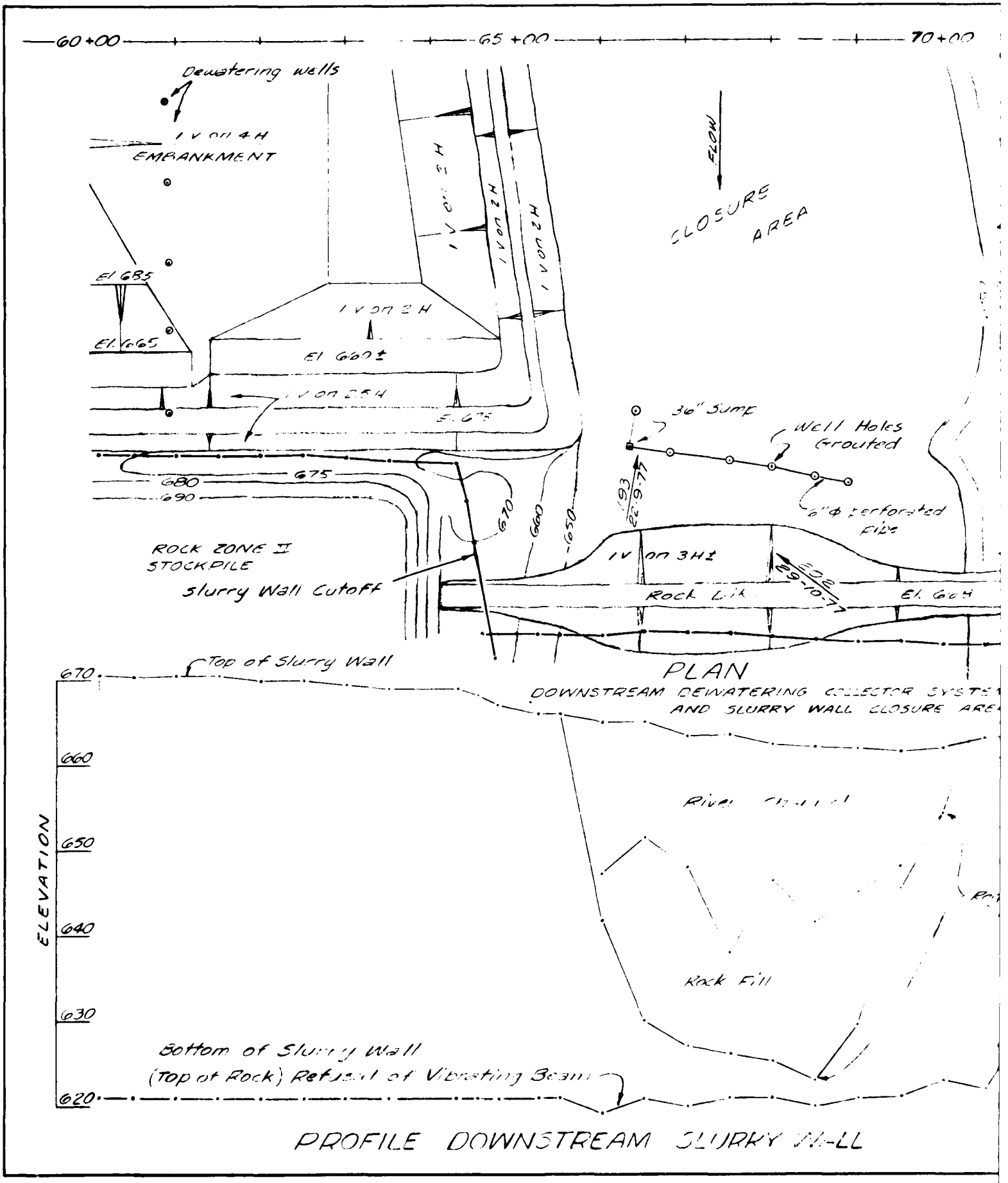
Designed by:
Drawn by:
Checked by:
Submitted by:

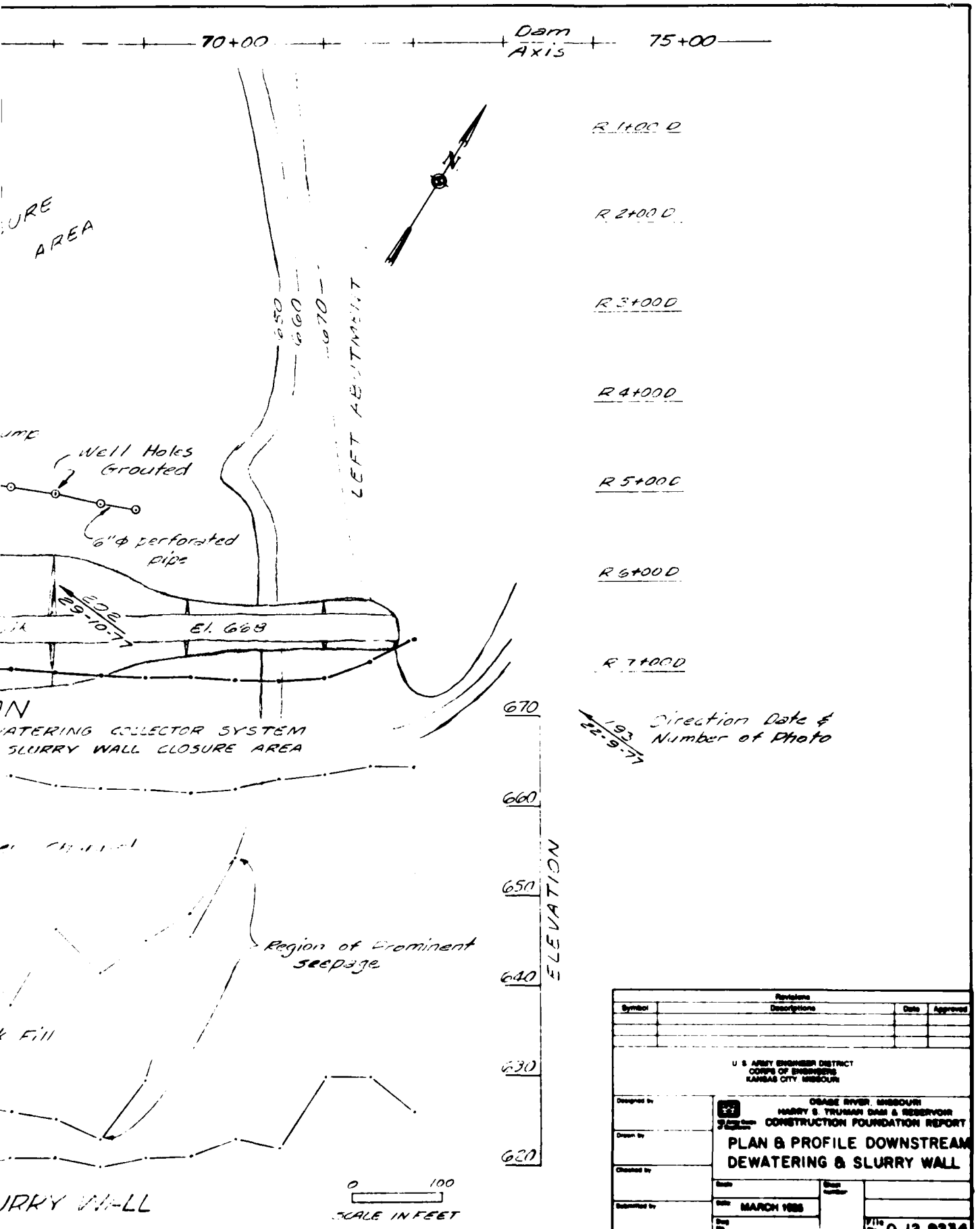
OSAGE RIVER, MISSOURI
HARRY S. TRUMAN DAM & RESERVOIR
CONSTRUCTION FOUNDATION REPORT

PLAN & PROFILE UPSTREAM DEWATERING & SLURRY WALL

Date: MARCH 1985
File No. 0-12-9233

PLATE NO. 103


60+00
65+00
70+00
Dewatering wells
1 V on 4 H
EMBANKMENT
1 V on 2 H
1 V on 2 H
1 V on 2 H
FLOW
CLOSURE
AREA
El 685
El. 665
1 V on 2 H
El 660±
1 V on 2.5 H
El. 675
36" Sump
Well Holes
Grouted
6"Φ perforated
Pipe
680
675
690
670
660
650
ROCK ZONE II
STOCKPILE
Slurry Wall Cutoff
1 V on 3 H±
Rock Fill
El. 660
PLAN
DOWNSTREAM DEWATERING COLLECTOR SYSTEM
AND SLURRY WALL CLOSURE AREA
Top of Slurry Wall
670
660
650
640
630
620
ELEVATION
River
Rock Fill
Bottom of Slurry Wall
(Top of Rock) Refusal of Vibrating Beam
PROFILE DOWNSTREAM SLURRY WALL



Revisions			
Symbol	Descriptions	Date	Approved

U. S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

OSAGE RIVER, MISSOURI
HARRY S. TRUMAN DAM & RESERVOIR
CONSTRUCTION FOUNDATION REPORT

PLAN & PROFILE DOWNSTREAM DEWATERING & SLURRY WALL

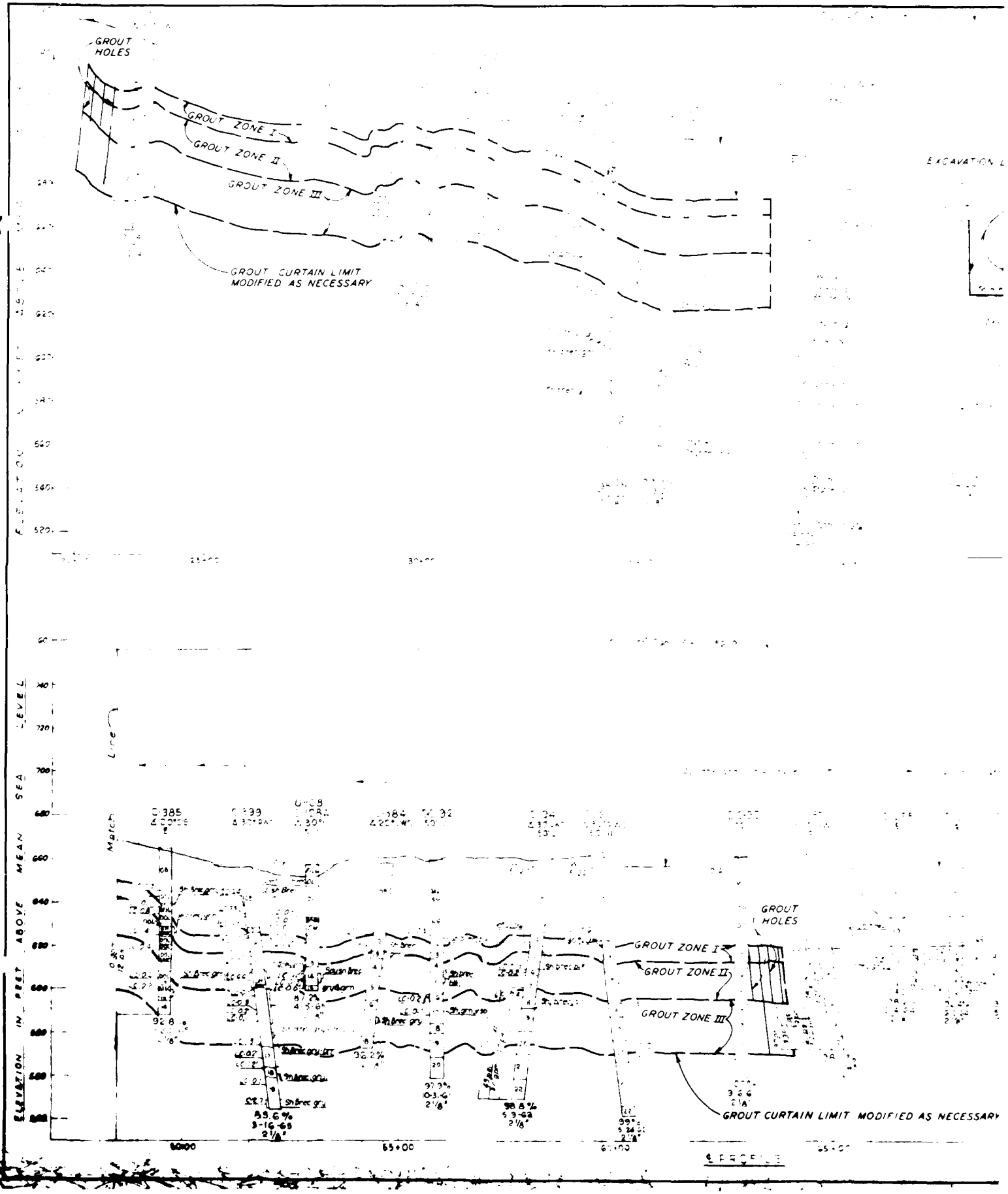
Designed by
Drawn by
Checked by
Submitted by
Scale
Date: MARCH 1986
File No. 0-12-9234

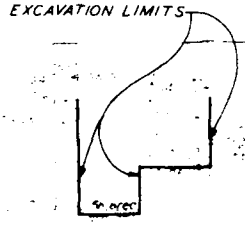
STAGE I CONSTRUCTION

STRUCTION

STAGE I CONSTRUCTION

CORPS OF ENGINEERS





NOTES

For Legend of Explorations and generalized geologic column see Plate 4

Water level readings were taken immediately prior to backfilling hole or when hole was left open, readings are the last reported

Where zones indicated by letters "A"-"D" are not indicated they are generally masked or not legible

Where Shale Breccias are indicated by a line the thickness is less than 0.5 foot

CORE BOX DETAILS

FOR EXPLORATORY DRILLING

GROUT HOLES

T CURTAIN LIMIT MODIFIED AS NECESSARY

65+00

FILE

DRAWINGS IN THIS FOLIO HAVE BEEN REDUCED TO ONE HALF THE ORIGINAL SCALE

Symbol	Revisions Description	Date	Approved

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

US Army Corps of Engineers

CONSTRUCTION FOUNDATION REPORT

DAM AXIS FOUNDATION BEDROCK AND GROUT CURTAIN PROFILE

Scale

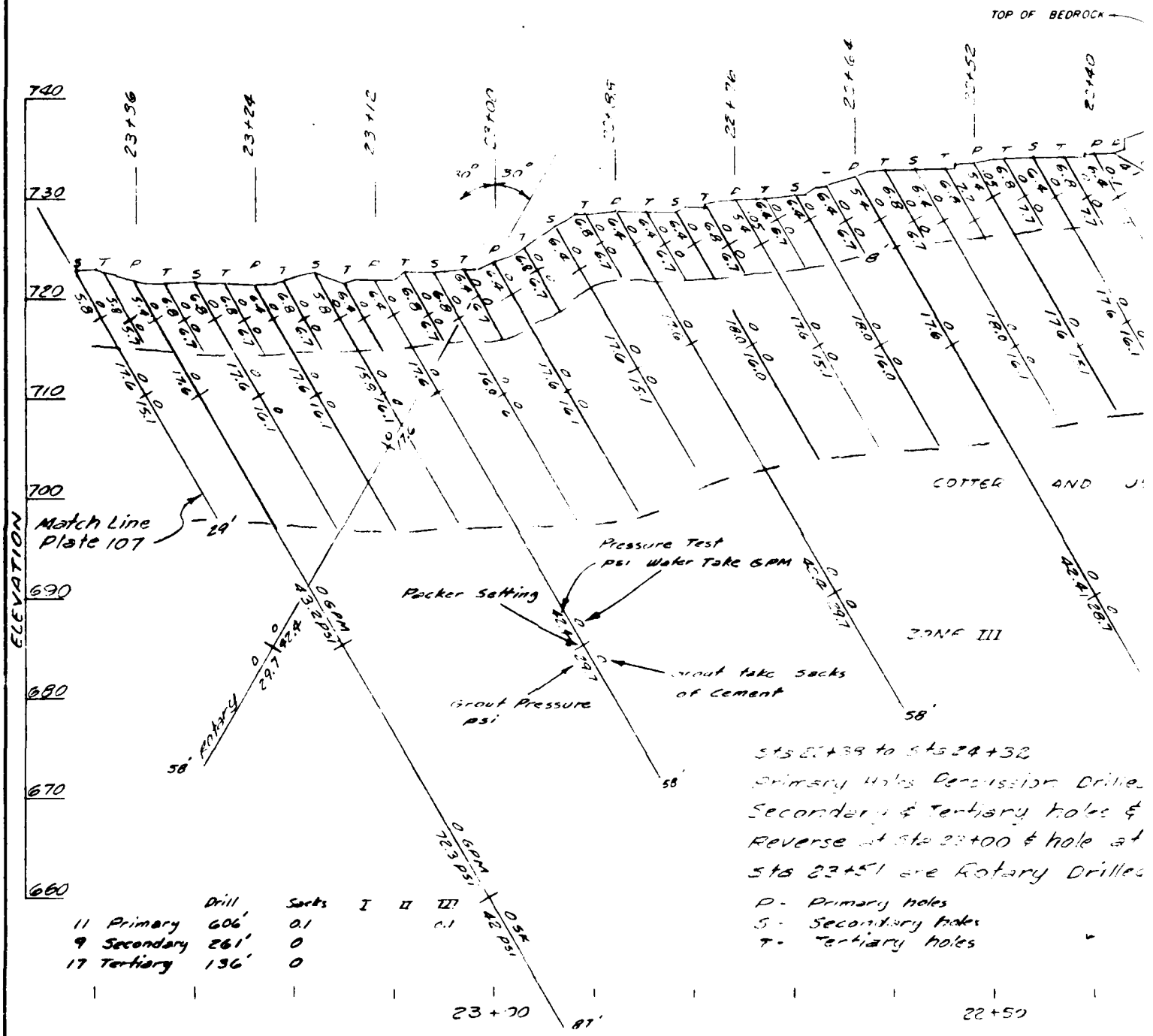
Sheet number

Date MARCH 1985

Dwg No. 0-12-9235

PLATE NO. 105

END GROUT CURTAIN
STAGE I STA 22+39
SECTION 7



LINE C STAGE I GROUT CURTAIN PROFILE STA
LOOKING DOWNSTREAM

Grout Line is on Dam Axis

0 10
SCALE IN FEET

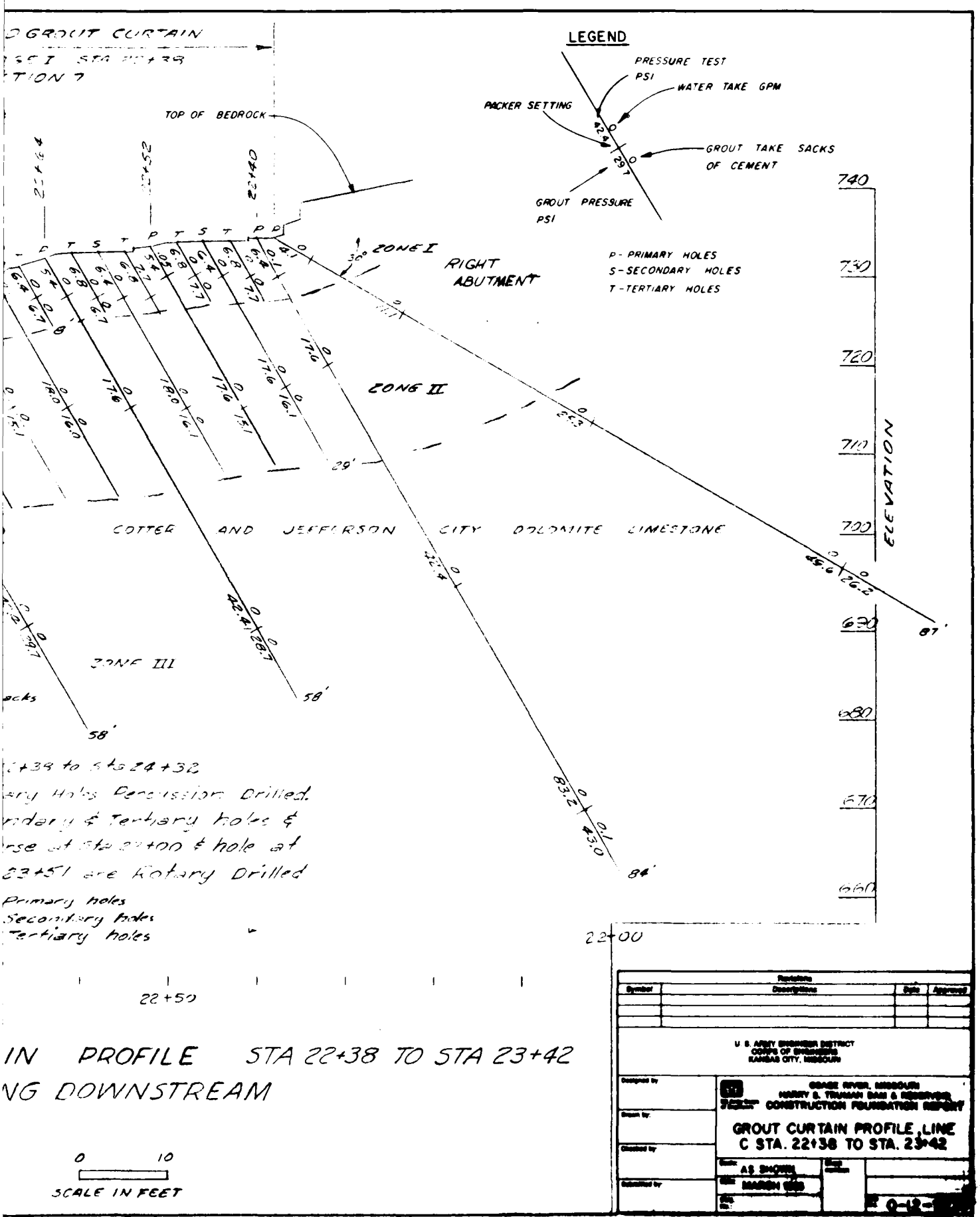
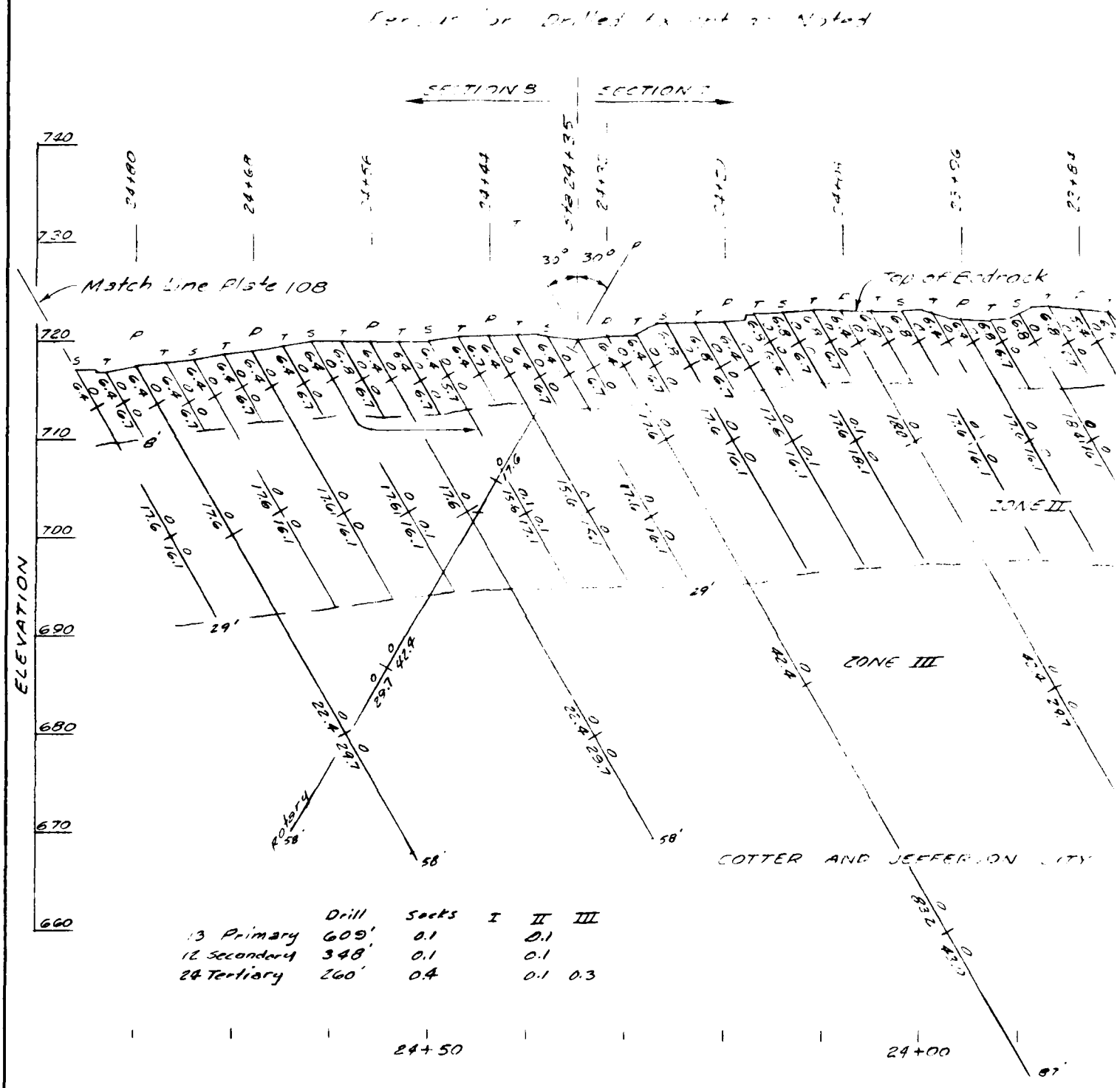

GROUT CURTAIN
LEGEND
PRESSURE TEST PSI
WATER TAKE GPM
PACKER SETTING
GROUT TAKE SACKS OF CEMENT
GROUT PRESSURE PSI
TOP OF BEDROCK
ZONE I
RIGHT ABUTMENT
P - PRIMARY HOLES
S - SECONDARY HOLES
T - TERTIARY HOLES
ZONE II
COTTER AND JEFFERSON CITY DOLOMITE LIMESTONE
ZONE III
ELEVATION
740
730
720
710
700
690
680
670
660
22+00
22+50
IN PROFILE STA 22+38 TO STA 23+42
NG DOWNSTREAM
0 10
SCALE IN FEET
U. S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI
GRANDE RIVER, MISSOURI
HARRY S. TRUMAN DAM & RESERVOIR
CONSTRUCTION FOUNDATION REPORT
GROUT CURTAIN PROFILE, LINE C STA. 22+38 TO STA. 23+42
AS SHOWN
MARCH

PLATE NO. 106

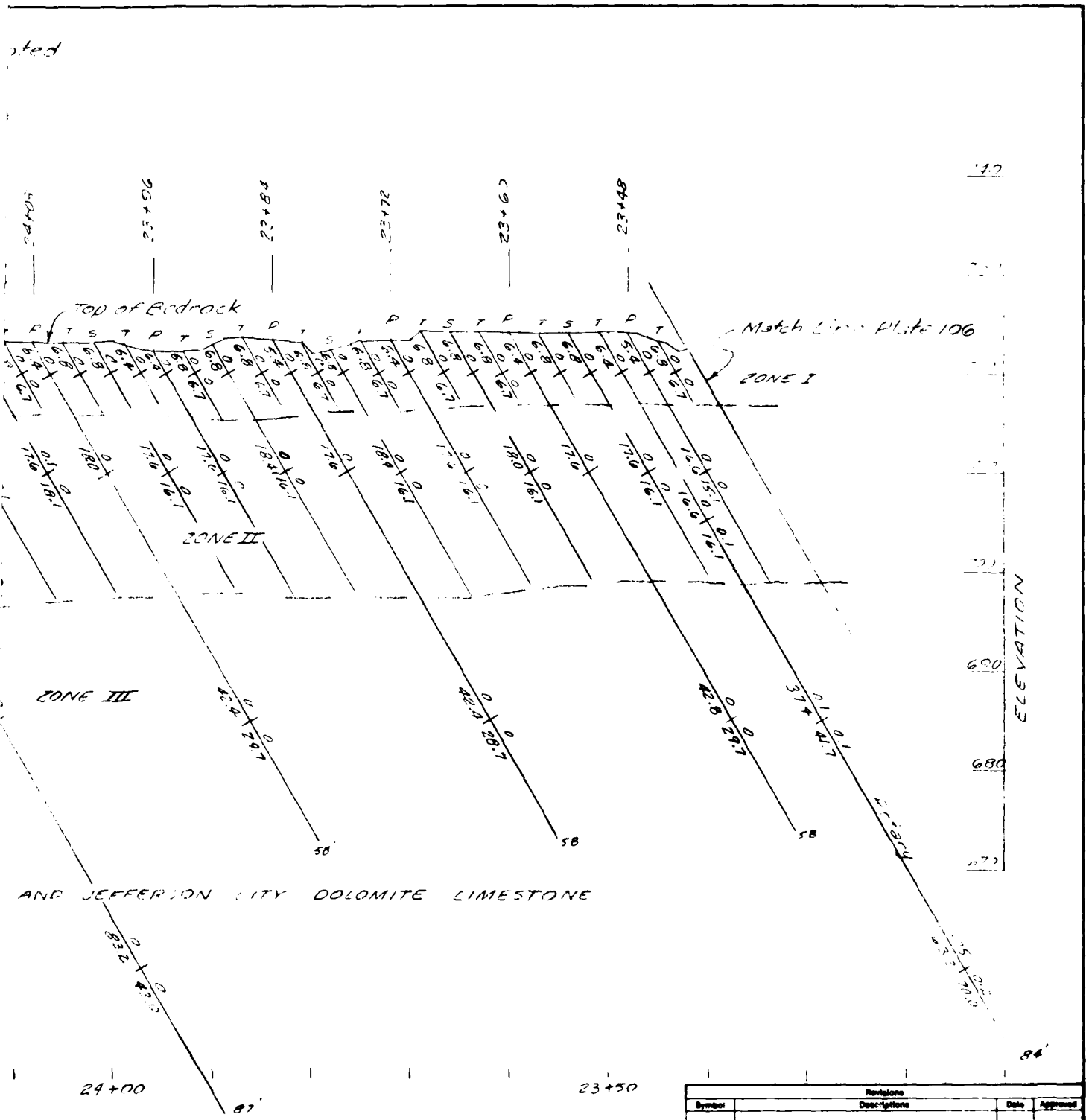


	Drill	Sacks	I	II	III
13 Primary	609'	0.1		0.1	
12 Secondary	348'	0.1		0.1	
24 Tertiary	260'	0.4		0.1	0.3

LINE C STAGE I GROUT CURTAIN PROFILE STA 23+42
LOOKING DOWNSTREAM

Grout Line is on Dam Axis

0 10
SCALE IN FEET



OFILE STA 23+42 TO STA 24+86
ING DOWNSTREAM

0 10
SCALE IN FEET

For Legend see Plate 106

Revisions			
Symbol	Descriptions	Date	Approved

U. S. ARMY ENGINEER DISTRICT
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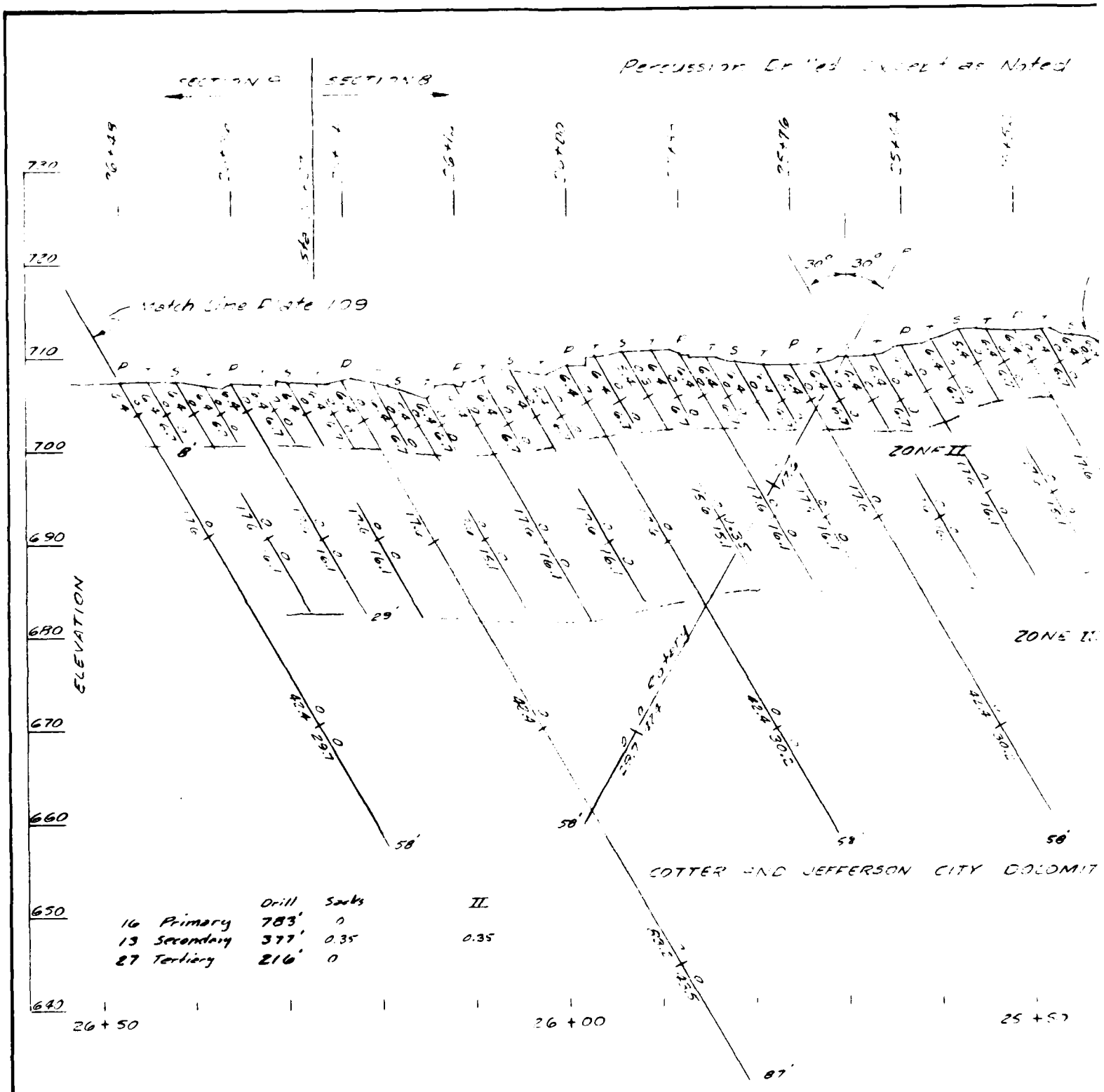
CONSTRUCTION FOUNDATION REPORT

GROUT CURTAIN PROFILE, LINE C STA. 23+42 TO STA 24+86

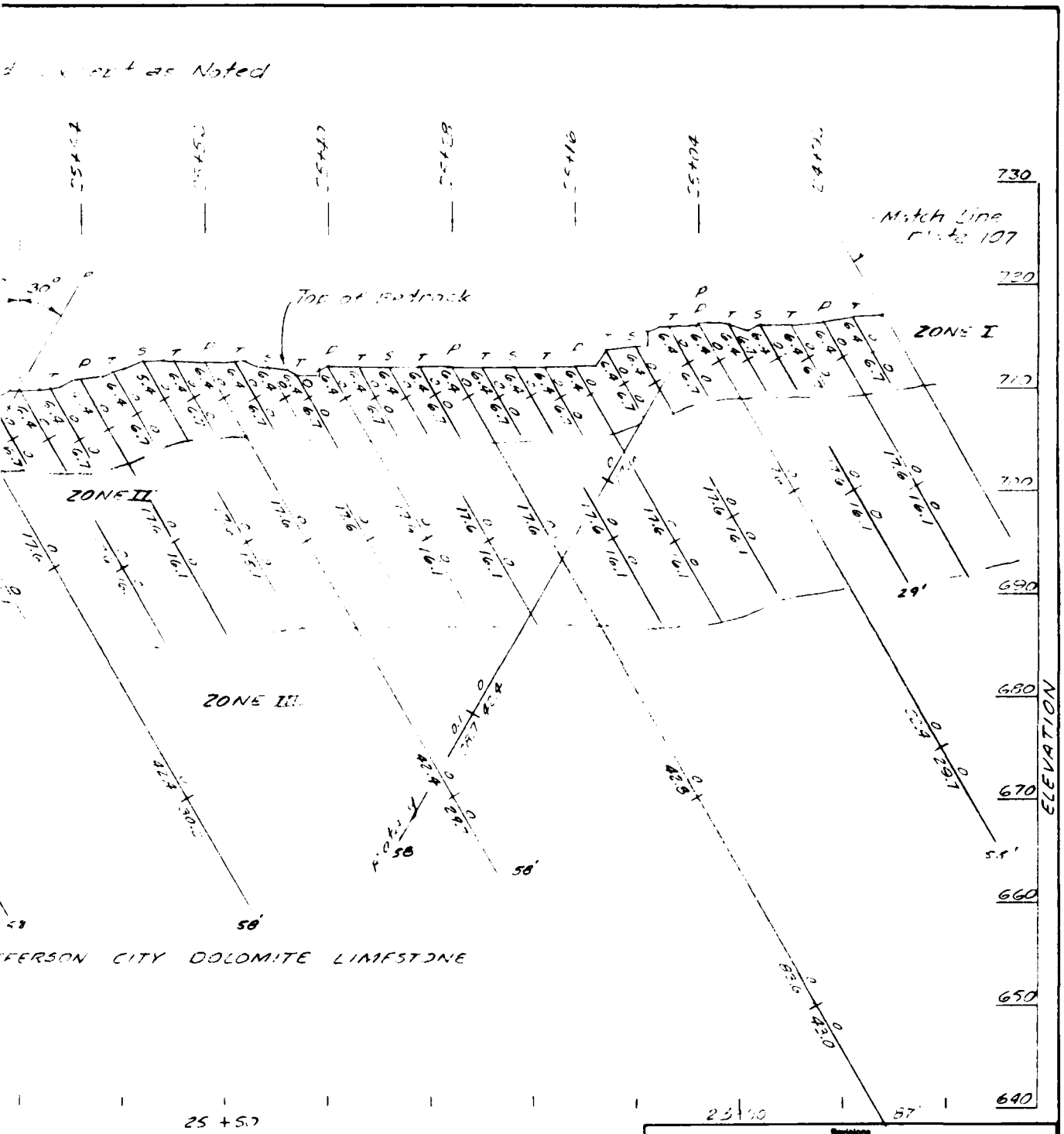
Scale AS SHOWN
Date MARCH 1966
Sheet number
File No. 0-12-9231



LINE C STAGE I GROUT CURTAIN PROFILE STA
LOOKING DOWNSTREAM

Grout Line is on Dam Axis

SCALE IN FEET



PROFILE STA 24+86 TO STA 26+48
DOWNSTREAM

0 10
ALL IN FEET

For Legend see Plate 106

Revisions			
Symbol	Descriptions	Date	Approved

U S ARMY ENGINEER DISTRICT
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KANSAS CITY, MISSOURI

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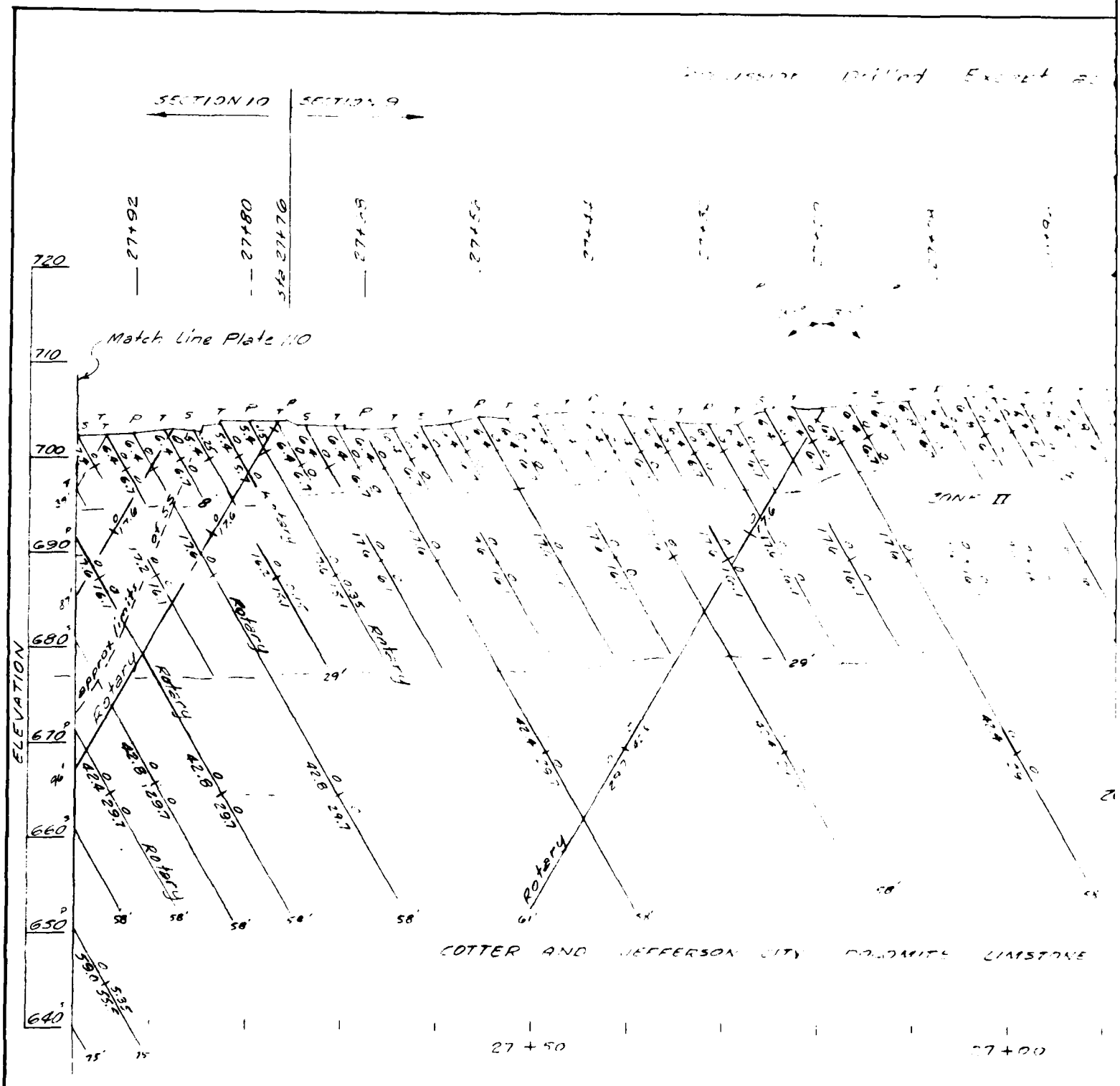
CONSTRUCTION FOUNDATION REPORT

GROUT CURTAIN PROFILE, LINE C STA. 24+86 TO STA. 26+48

Scale AS SHOWN
Date MARCH 1966
Sheet number
File No. 0-12-9238

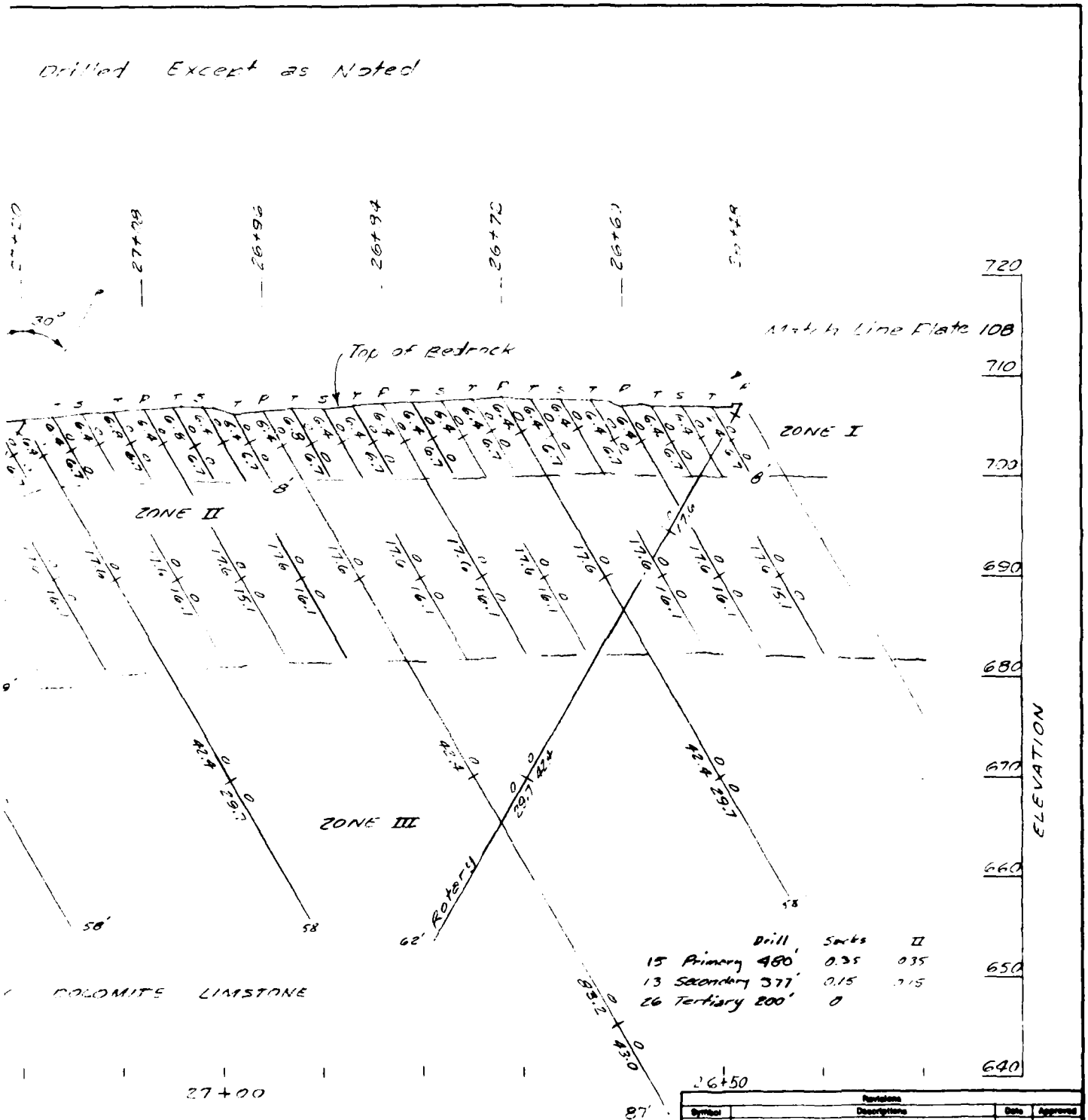
PLATE NO. 108



LINE C STAGE I GROUT CURTAIN PROFILE STA 26+48
LOOKING DOWNSTREAM

Grout line is on Dam Axis

0 10
SCALE IN FEET



FILE STA 26+48 TO STA 27+98
DOWNSTREAM

10
FEET

For Legend see Plate 106

Revisions			
Symbol	Descriptions	Date	Approved

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CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

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CONSTRUCTION FOUNDATION REPORT

GROUT CURTAIN PROFILE, LINE C STA. 26+48 TO STA. 27+98

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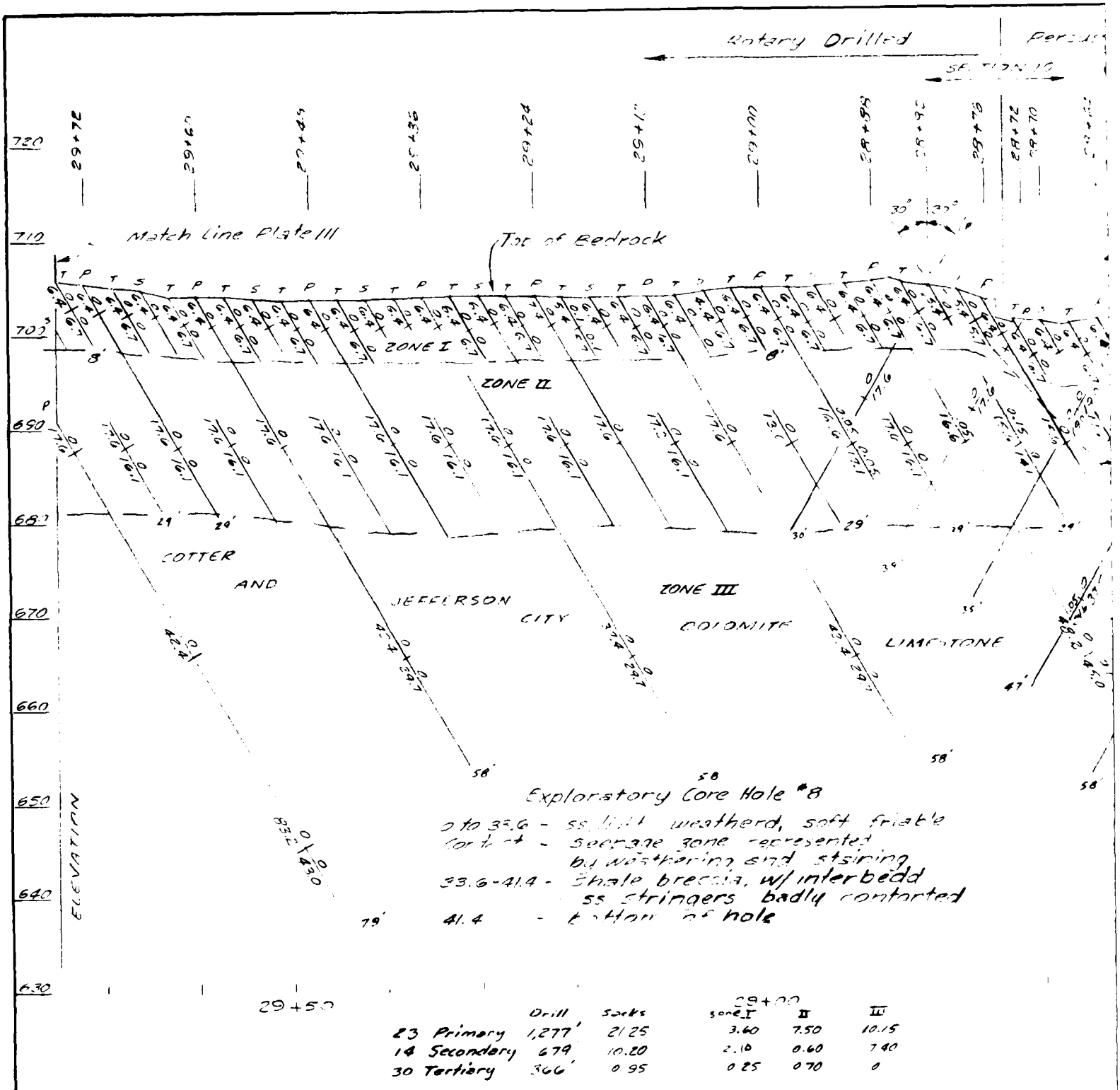
Scale AS SHOWN
Date MARCH 1985
File No. 0-2-9239

PLATE NO. 109



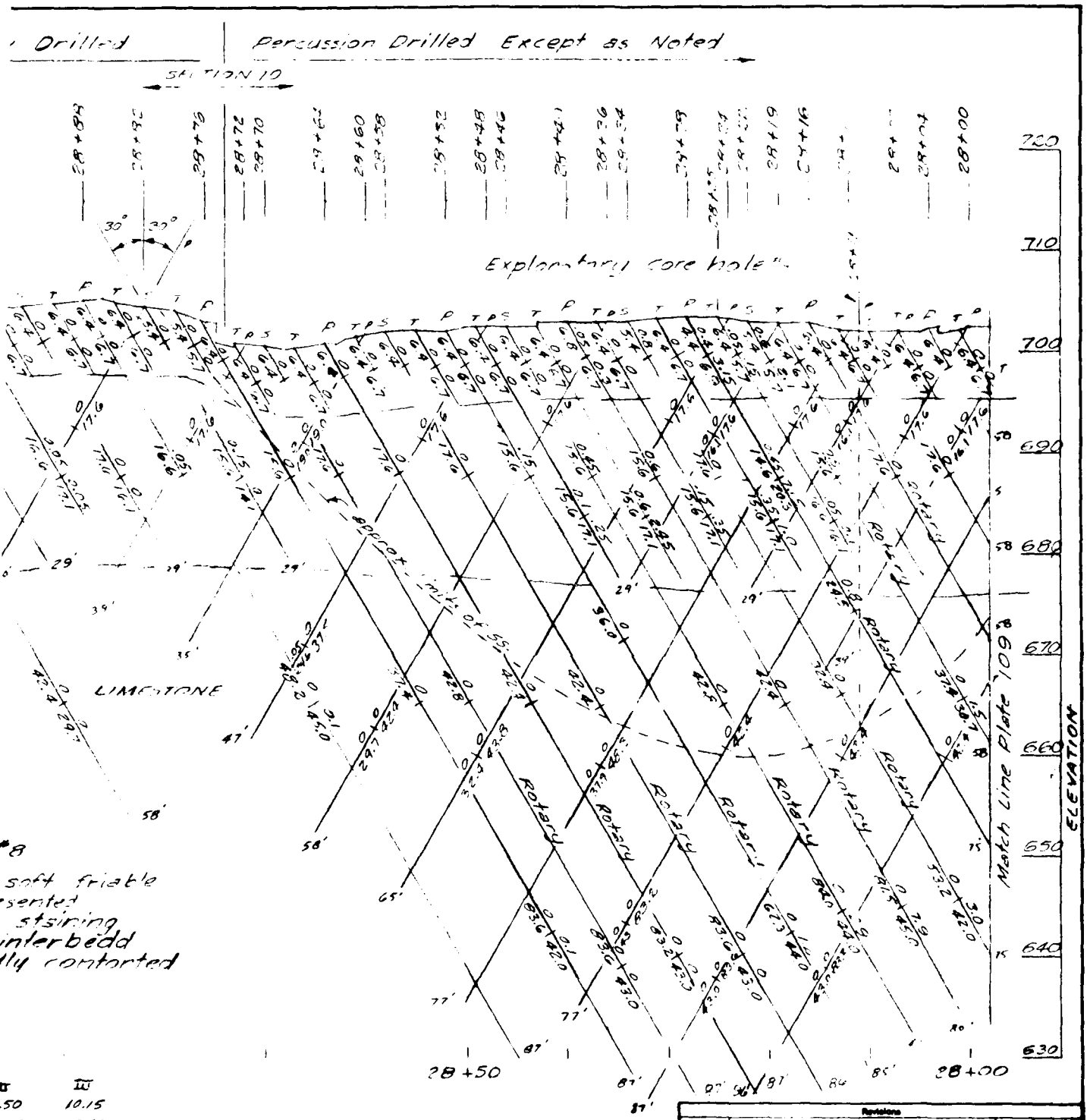
	Drill	Sacks	Zone I	II	III
23 Primary	1,277'	21.25	3.60	7.50	10.15
14 Secondary	679	10.20	2.10	0.60	7.40
30 Tertiary	366'	0.95	0.25	0.70	0

LINE C STAGE I GROUT CURTAIN PROFILE STA
LOOKING DOWNSTREAM

Grout Line is on Dam Axis

SCALE IN FEET

FOR



soft friable
sented
stsining
interbedd
lly contorted

II	III
.50	10.15
.60	7.40
.70	0

AIN PROFILE STA 27+98 TO STA 29+75
DOWNSTREAM

0 10
SCALE IN FEET

For Legend see Plate 106

Revisions			
Symbol	Descriptions	Date	Approved

U. S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

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CONSTRUCTION FOUNDATION REPORT

GROUT CURTAIN PROFILE, LINE C STA. 27+98 TO STA. 29+75

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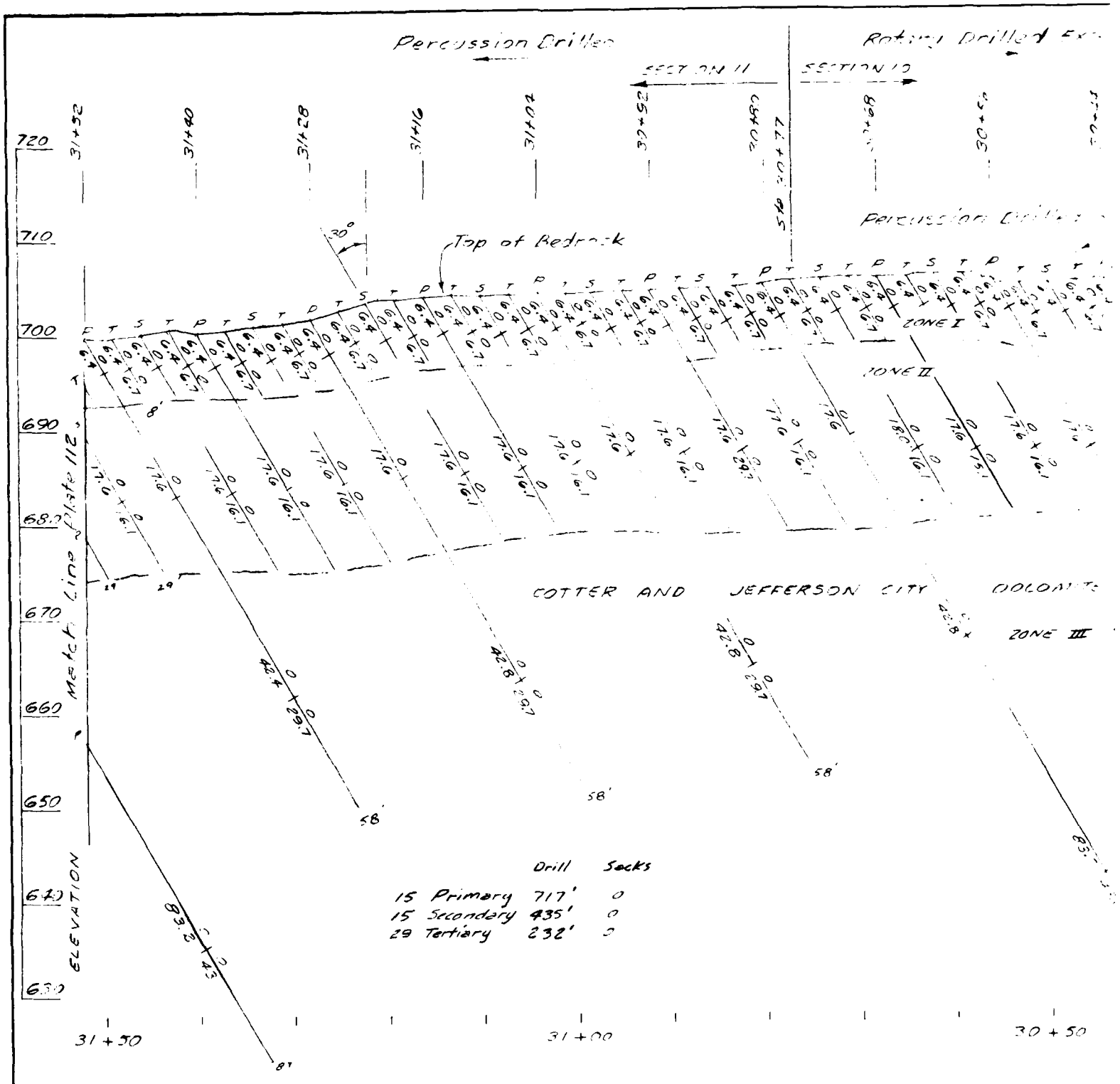
Scale: AS SHOWN
Date: MARCH 1966
Sheet number
File No. 0-12-9240

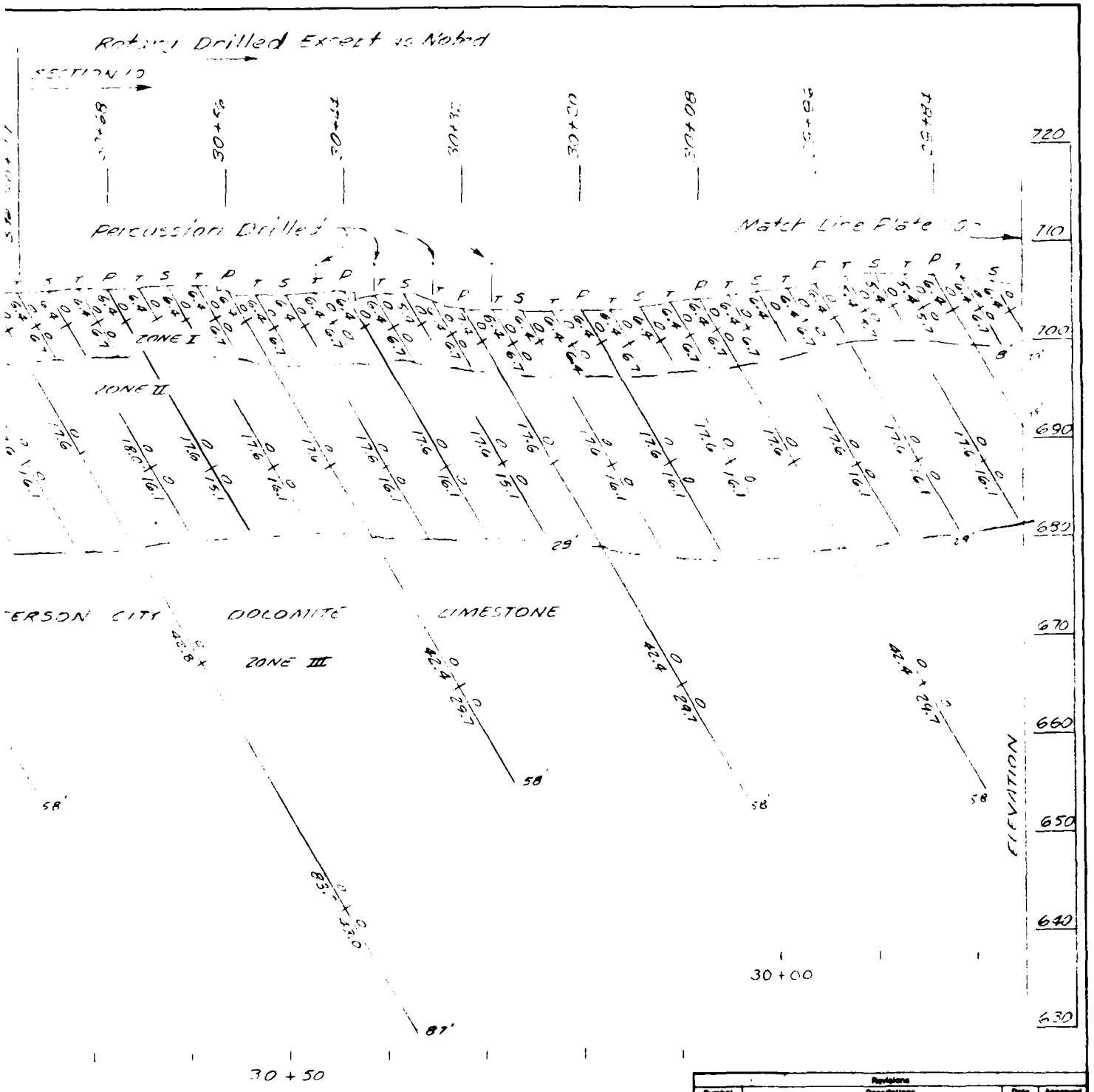
PLATE NO. 110



LINE C STAGE I GROUT CURTAIN PROFILE STA

Grout Line is on Dam Axis

0 10
SCALE IN FEET



TAIN PROFILE STA 29+75 TO STA 31+52

DAMS DOWNSTREAM

0 10

SCALE IN FEET

For legend see Plate 106

Revisions			
Symbol	Description	Date	Approved

U S ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
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HARRY S. TRUMAN DAM & RESERVOIR
CONSTRUCTION FOUNDATION REPORT

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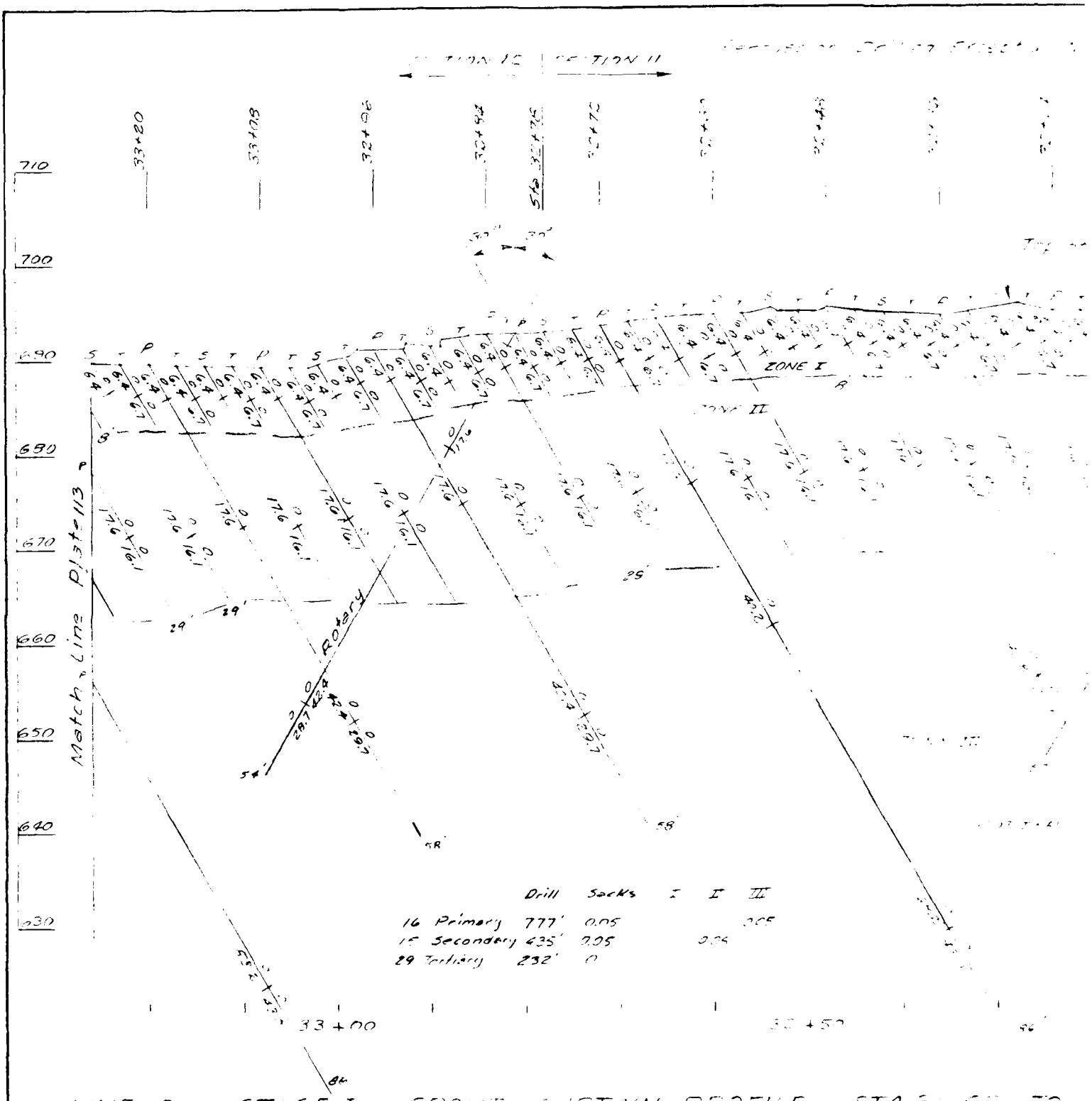
GROUT CURTAIN PROFILE, LINE C STA. 29+75 TO STA. 31+52

Scale: AS SHOWN
Date: MARCH 1986
Sheet number
Drawing No.
No. 0-12-9241

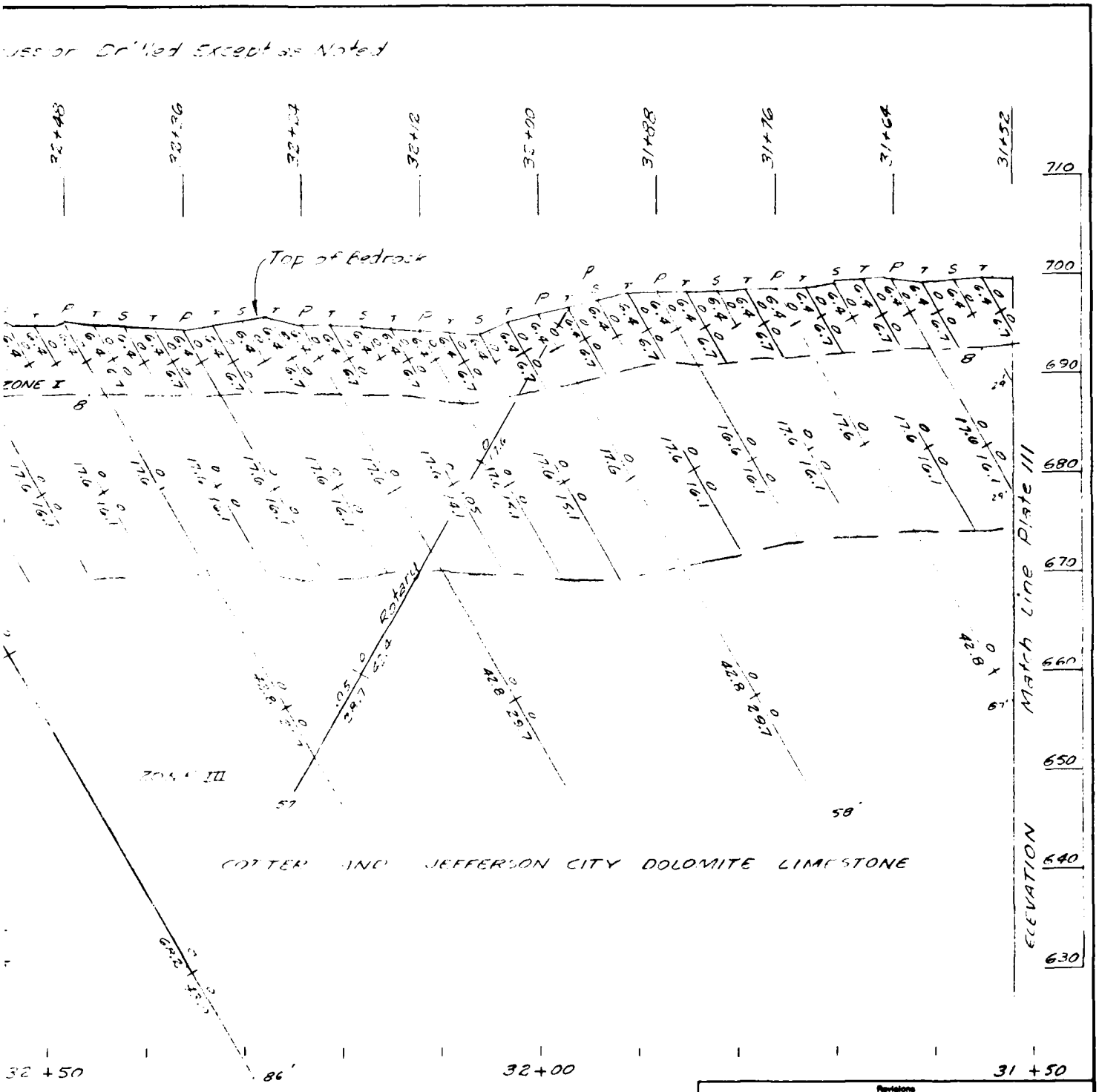
PLATE NO. 111



LINE C STAGE I GROUT CURTAIN PROFILE STA 3+55 TO

Grout Line is on Dam Axis

SCALE IN FEET



LE STA 31+52 TO STA 33+26
OWNSTREAM
0 10
SCALE IN FEET

For Legend See Plate 106

Revisions			
Symbol	Descriptions	Date	Approved

U S ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

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CONSTRUCTION FOUNDATION REPORT

GROUT CURTAIN PROFILE, LINE C STA. 31+52 TO STA. 33+26

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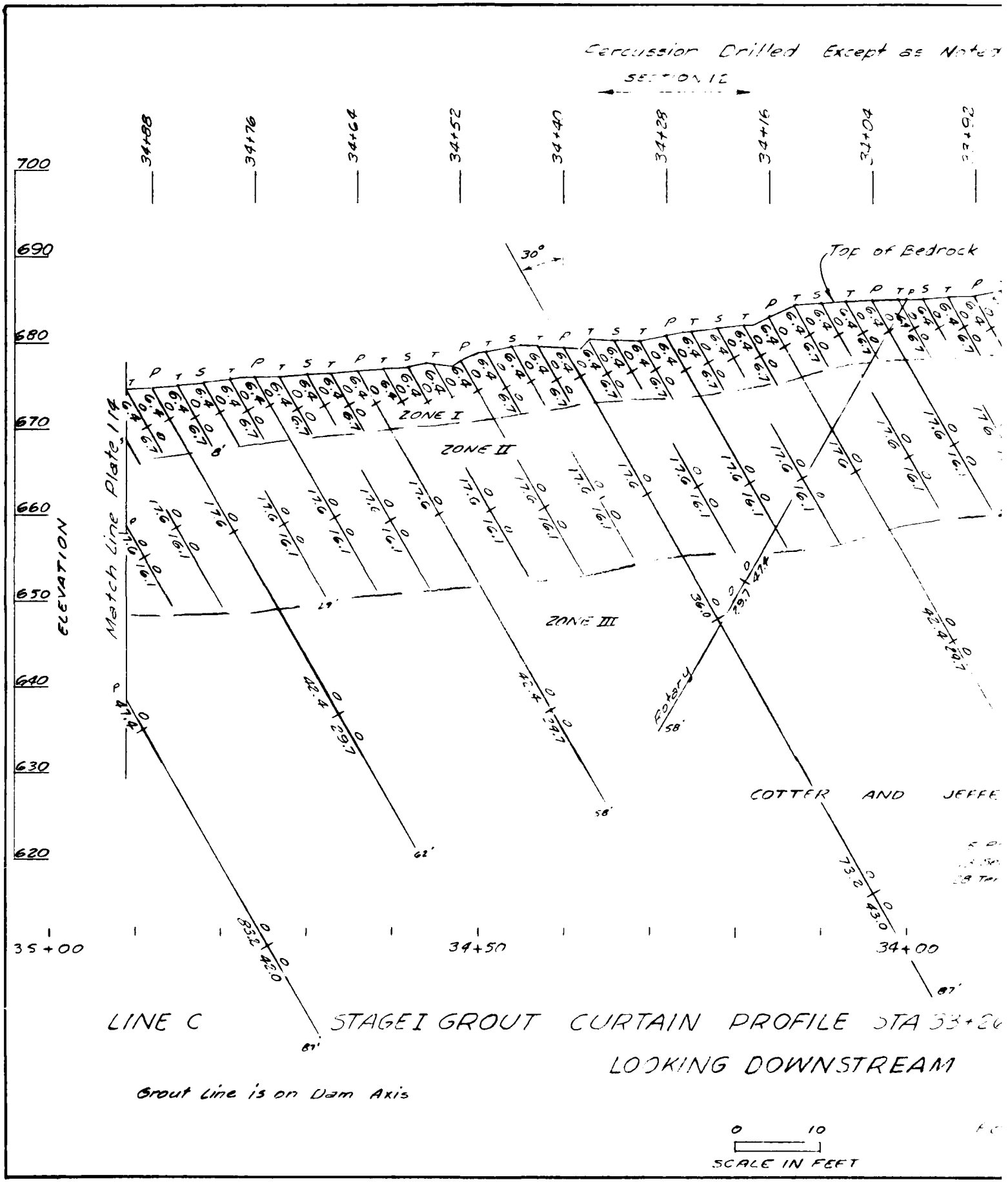
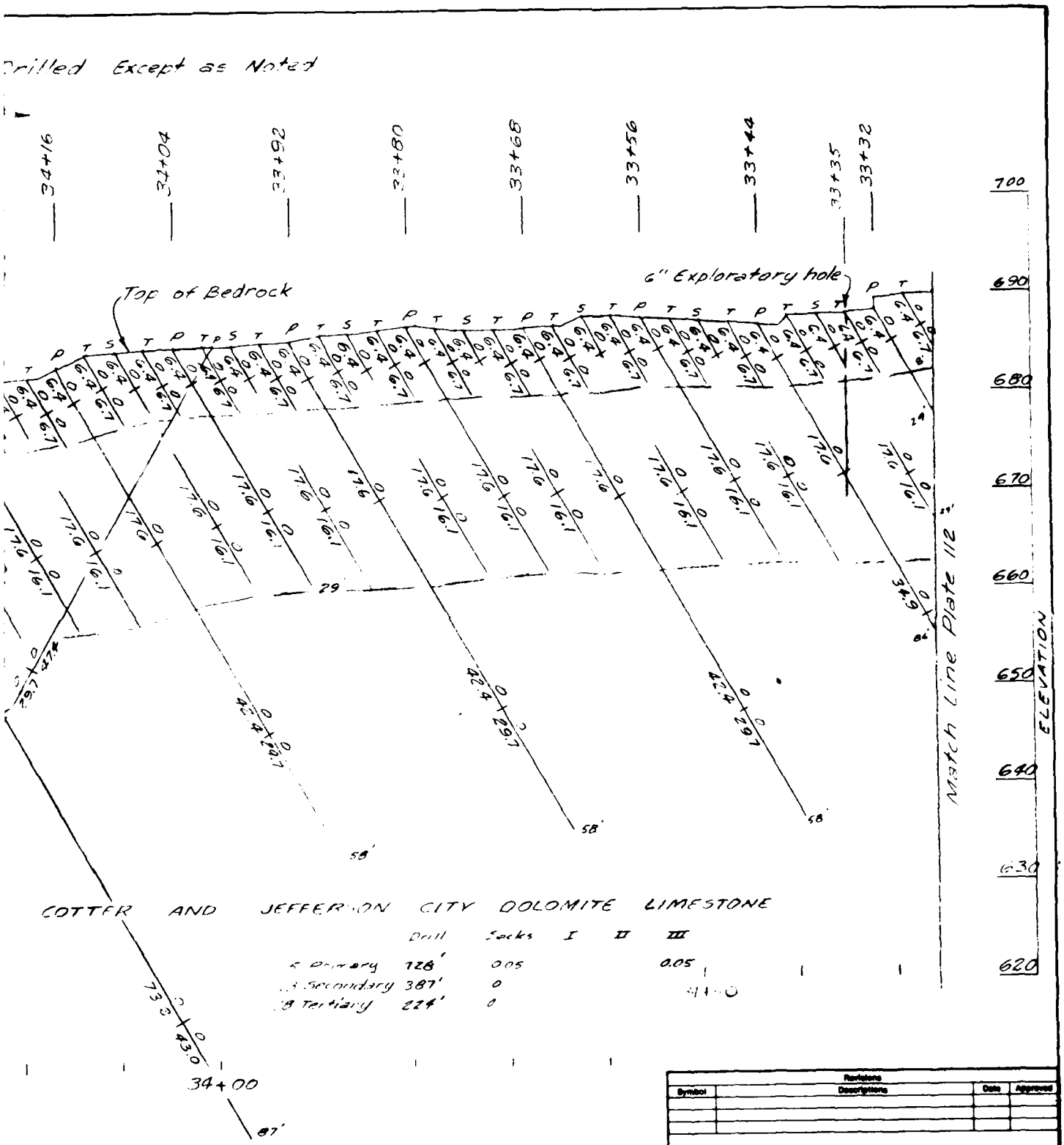
Scale AS SHOWN
Date MARCH 1988
Sheet number
Dwg No. C-12-9248

PLATE NO. 112


Percussion Drilled Except as Noted
SECTION 12
34+88
34+76
34+64
34+52
34+40
34+28
34+16
34+04
33+92
700
690
680
670
660
650
640
630
620
ELEVATION
Match Line Plate 1/14
Top of Bedrock
30°
ZONE I
ZONE II
ZONE III
Rotary
COTTER AND JEFFE
35+00
34+50
34+00
LINE C STAGE I GROUT CURTAIN PROFILE STA 33+20
LOOKING DOWNSTREAM
Grout Line is on Dam Axis
0 10
SCALE IN FEET



PROFILE STA 33+26 TO STA 34+91

5 DOWNSTREAM

For Legend see Plate 106

0 10

SCALE IN FEET

Revisions			
Symbol	Descriptions	Date	Approved

U. S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

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CONSTRUCTION FOUNDATION REPORT

GROUT CURTAIN PROFILE, LINE C STA. 33+26 TO STA. 34+91

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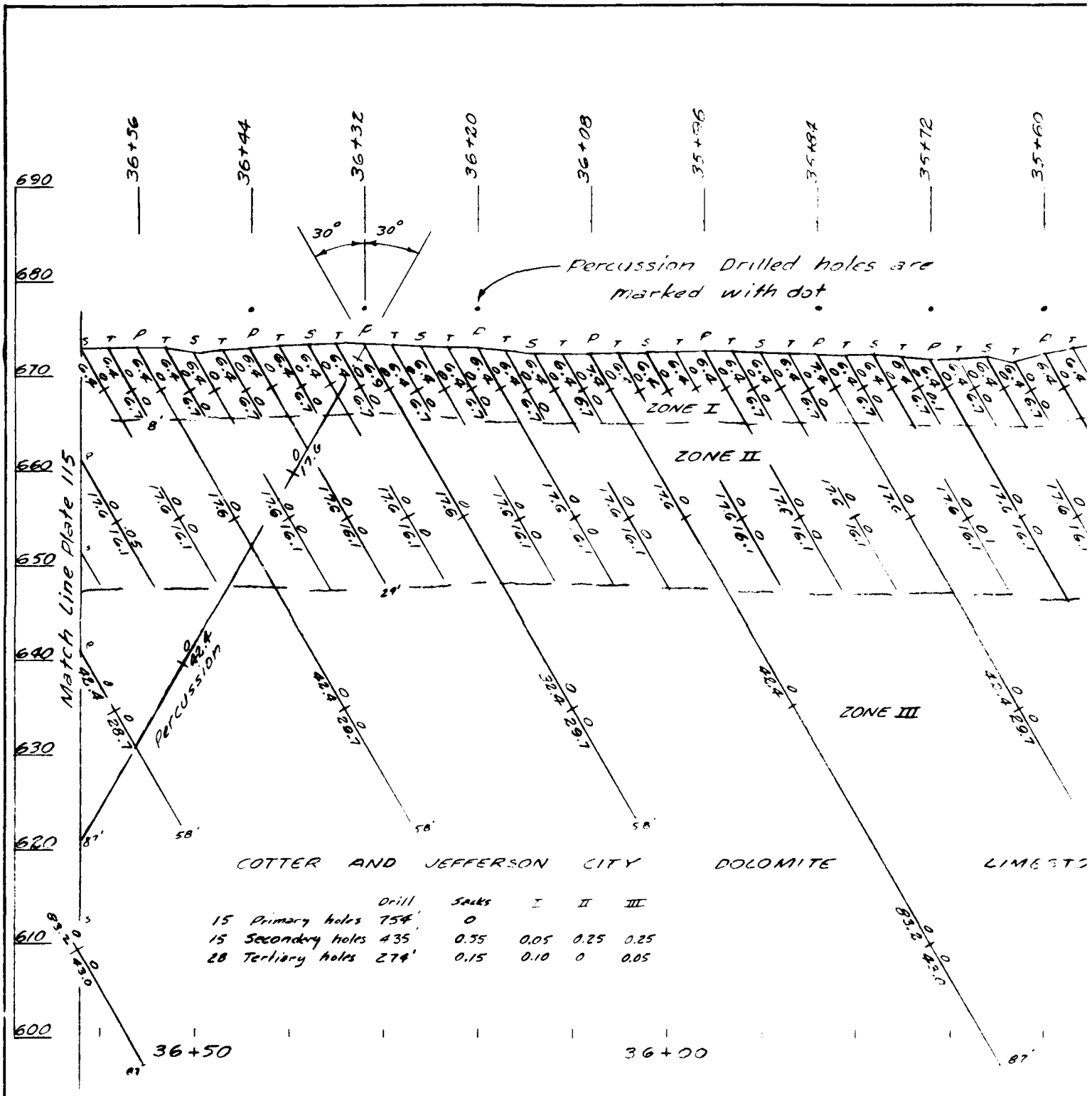
Scale: AS SHOWN
Date: MARCH 1966
Sheet number:
No. 0-12-8243

PLATE NO. 113



	Drill	Sacks	I	II	III
15 Primary holes	754'	0			
15 Secondary holes	435'	0.35	0.05	0.25	0.25
28 Tertiary holes	274'	0.15	0.10	0	0.05

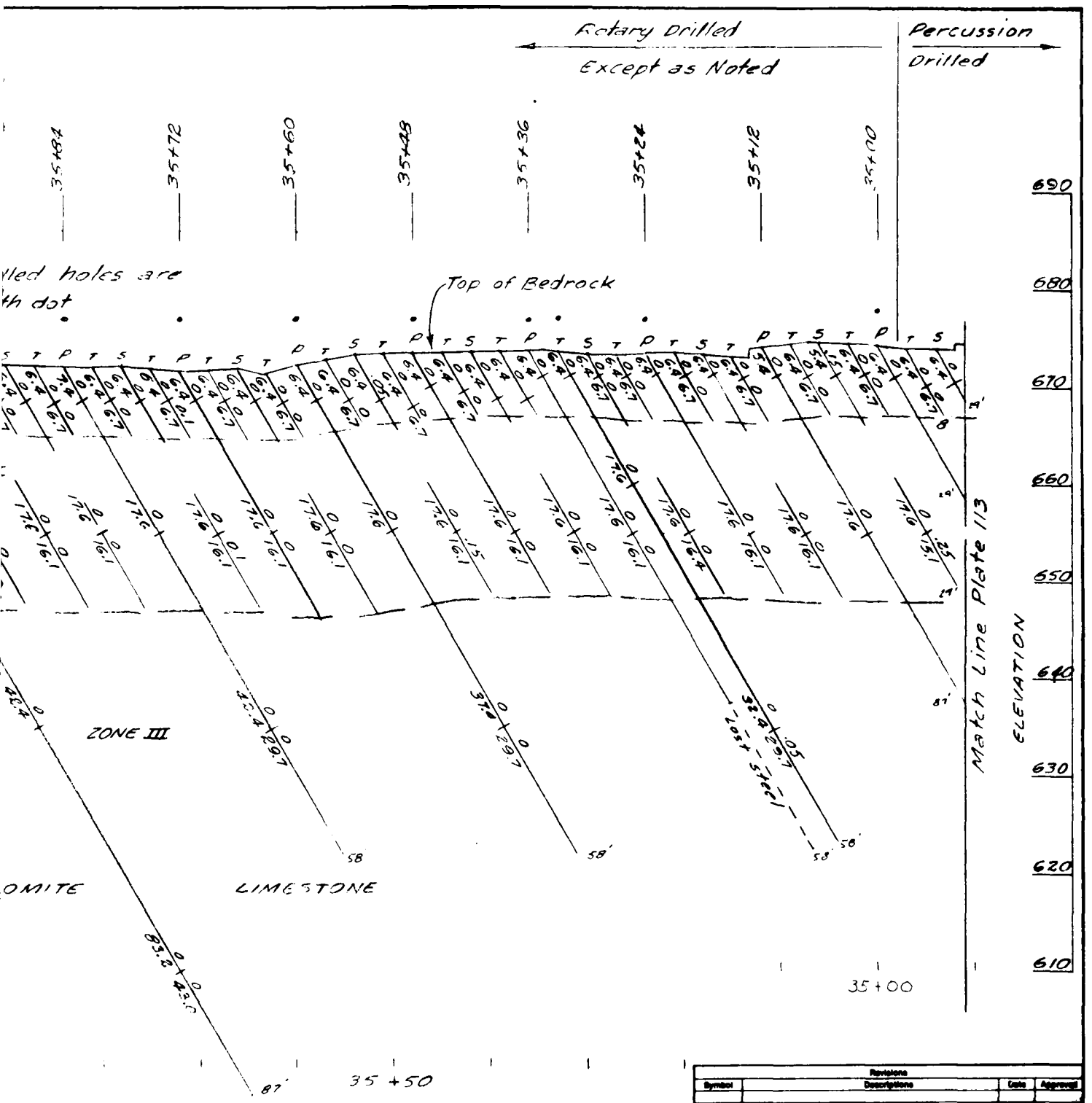
LINE C STAGE I GROUT CURTAIN PROFILE STA 34+

LOOKING DOWNSTREAM

Grout Line is on Dam Axis

0 10

SCALE IN FEET



N PROFILE STA 34+91 TO STA 36+62
ING DOWNSTREAM

0 10
SCALE IN FEET

For Legend see Plate 106

Revisions			
Symbol	Descriptions	Date	Approval

U. S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

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Checked by:
Submitted by:

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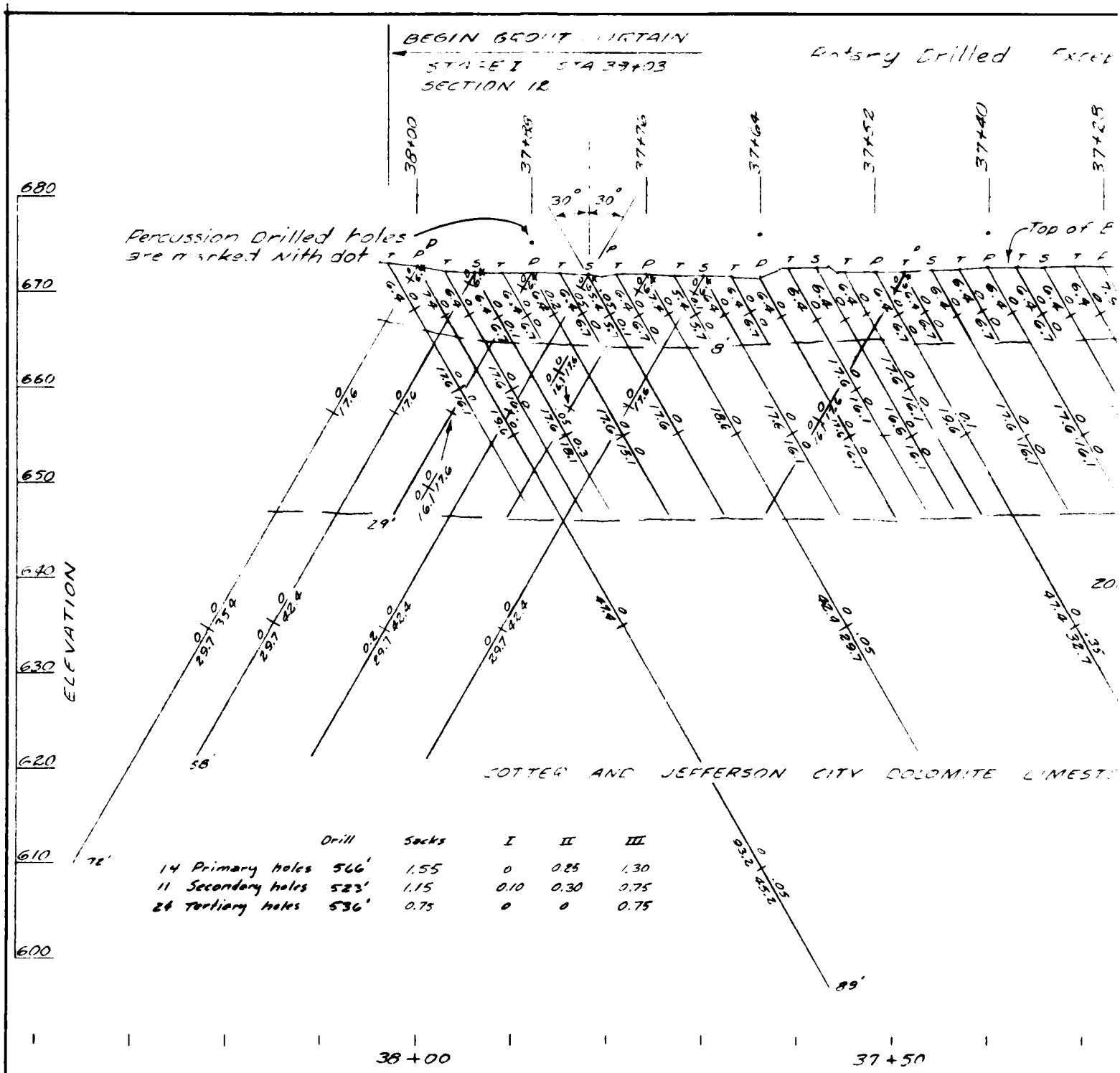
HARRY S. TRUMAN DAM & RESERVOIR
CONSTRUCTION FOUNDATION REPORT

GROUT CURTAIN PROFILE, LINE C STA. 34+91 TO STA. 36+62

Scale: AS SHOWN
Date: MARCH 1968
Sheet number:
Dwg. No.: 0-12-2244

PLATE NO. 114



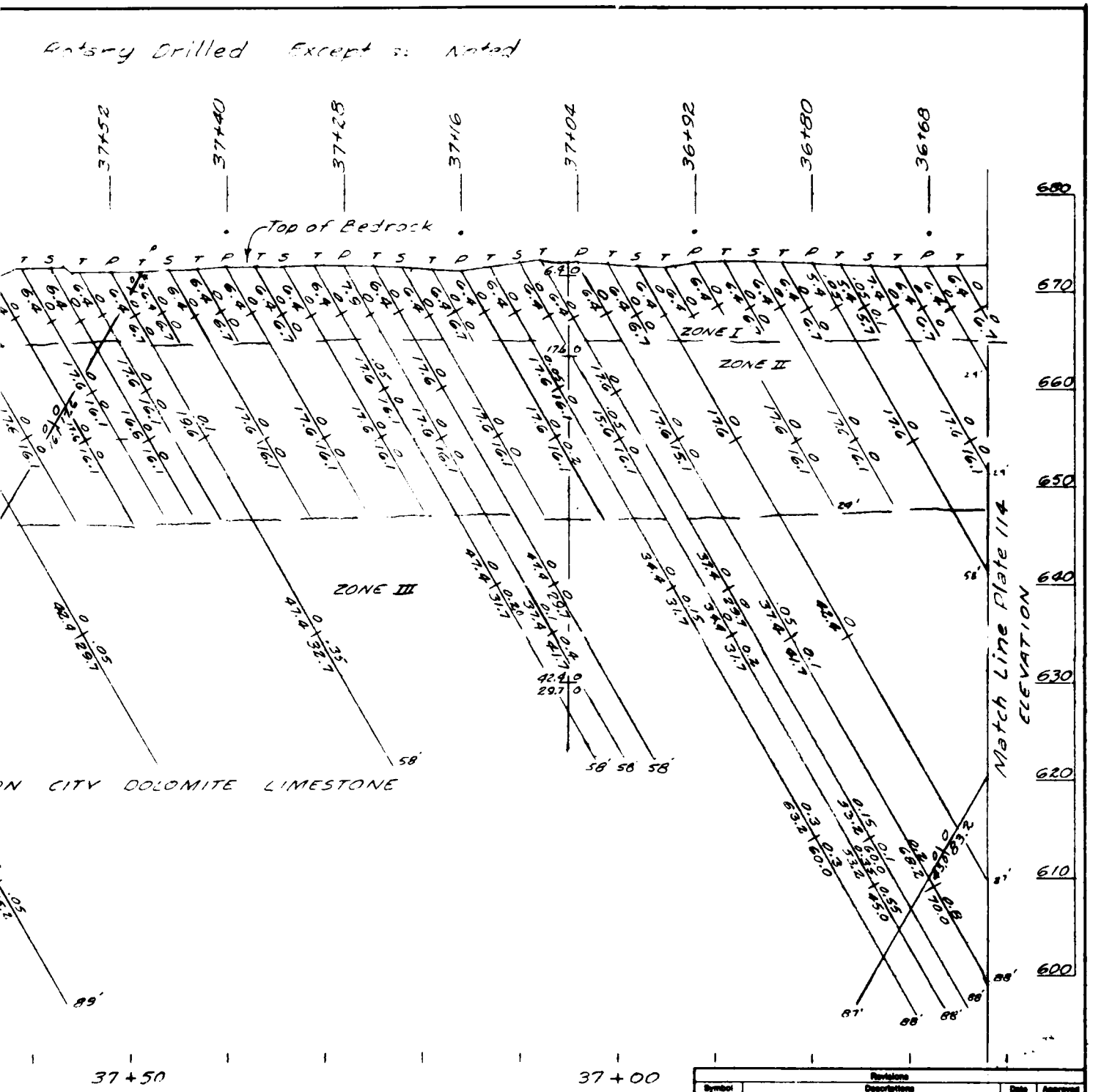
	Drill	Sacks	I	II	III
14 Primary holes	566'	1.55	0	0.25	1.30
11 Secondary holes	523'	1.15	0.10	0.30	0.75
24 Tertiary holes	536'	0.75	0	0	0.75

LINE C STAGE I GROUT CURTAIN PROFILE STA 36+6
LOOKING DOWNSTREAM

Grout Line is on Dam Axis

0 10
SCALE IN FEET

For Le



IN PROFILE STA 36+62 TO STA 38+03
KING DOWNSTREAM

0 10
SCALE IN FEET

For Legend see Plate 106

Revisions			
Symbol	Descriptions	Date	Approved

U. S. ARMY ENGINEER DISTRICT
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GROUT CURTAIN PROFILE, LINE C STA. 36+62 TO STA. 38+03

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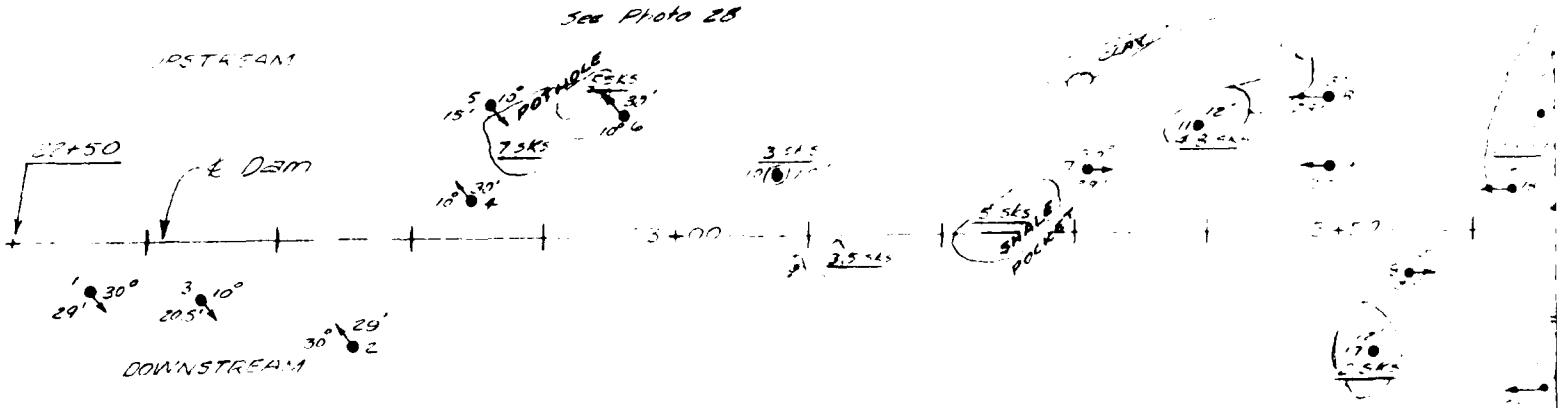
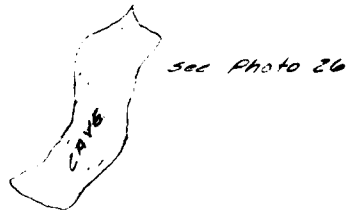
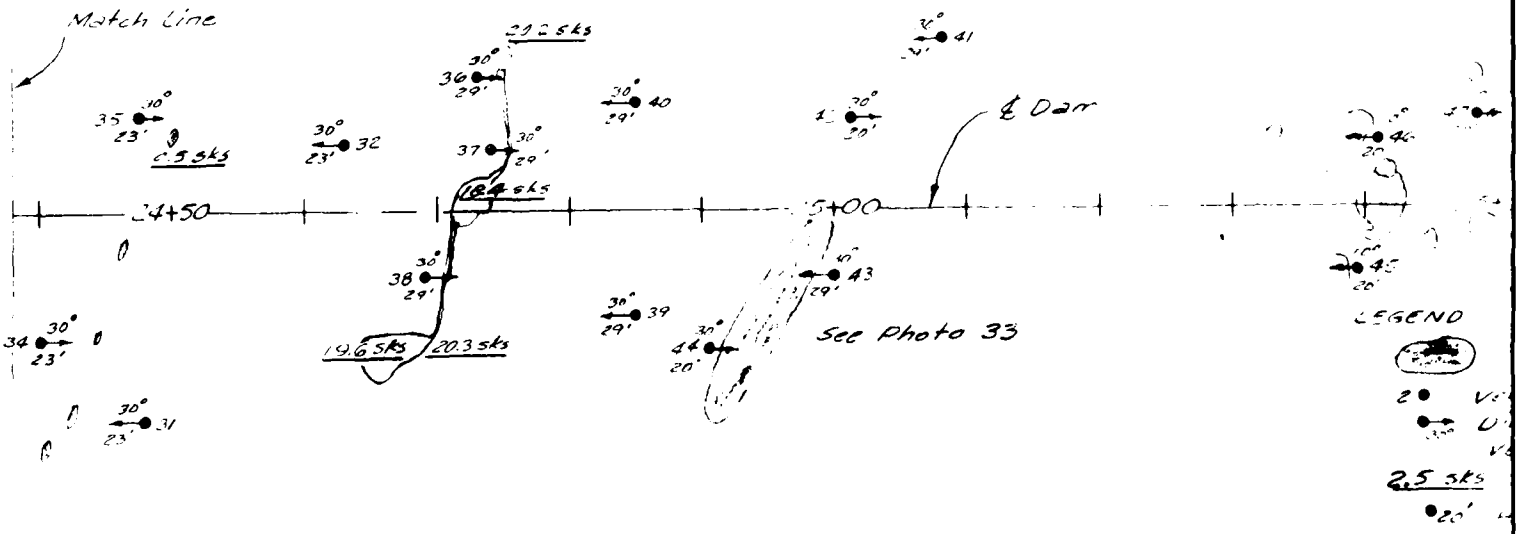
Scale: AS SHOWN
Date: MARCH 1968
File No. 0-12-6246

PLATE NO. 115

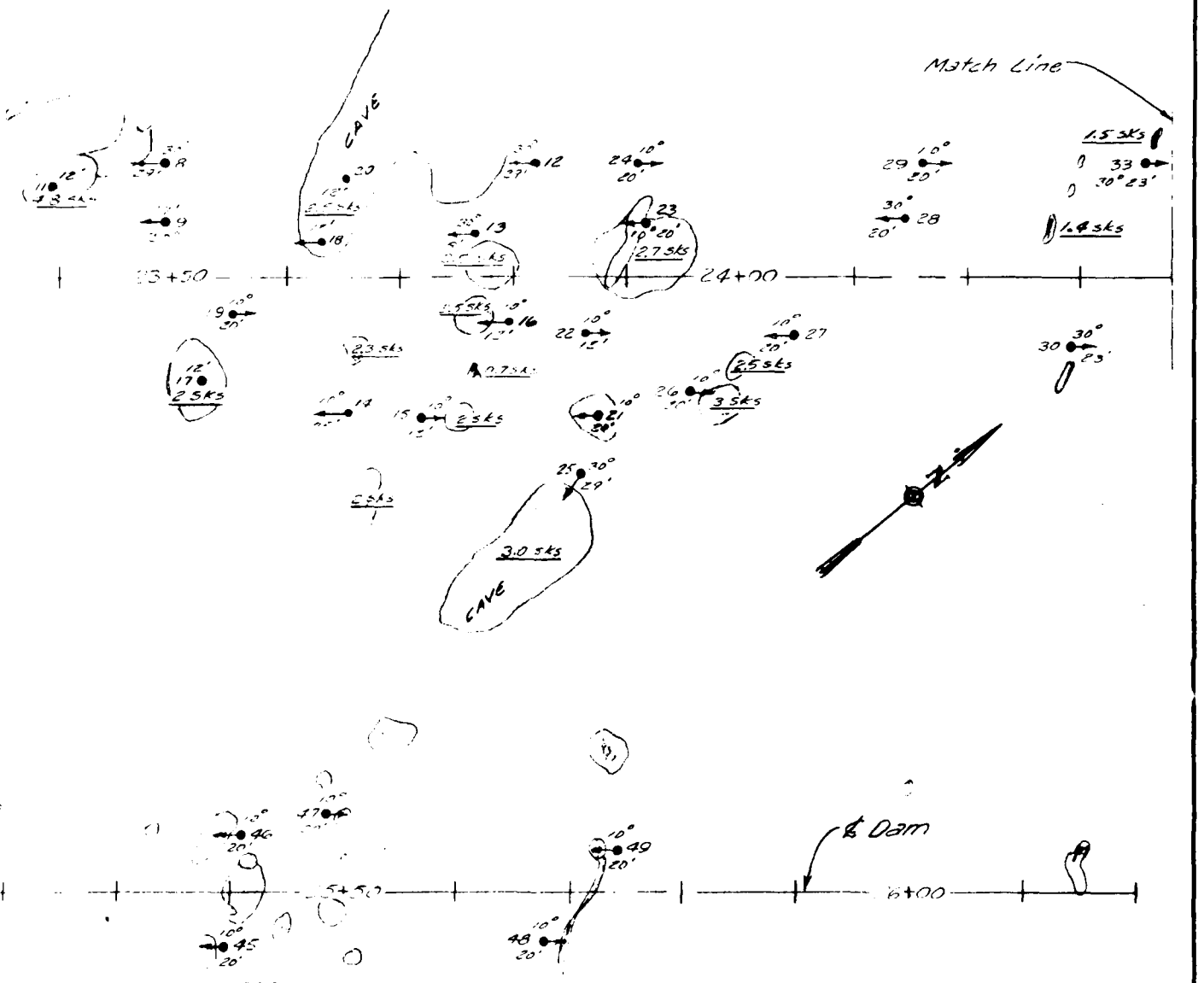






STAGE I LOCATION OF GROUT HOLES AND KARS
IN CUTOFF TRENCH

Drilled 1,086.5 Lineal feet in 50 holes
Injected 58.7 Sacks of Grout in 13 holes
Injected 79.2 Sacks of Grout in 12 Open caves



LEGEND

Cave, shale or clay Pothole

2 ● Vertical Grout Hole & Number

Direction of Hole & Degree from vertical of Inclined Hole

2.5 sks Grout Injected - Sacks

●20' Hole Depth - Feet

Sept 66

HOLES AND KARST FEATURES
FF TRENCH

SCALE IN FEET

Revisions			
Symbol	Descriptions	Date	Approved

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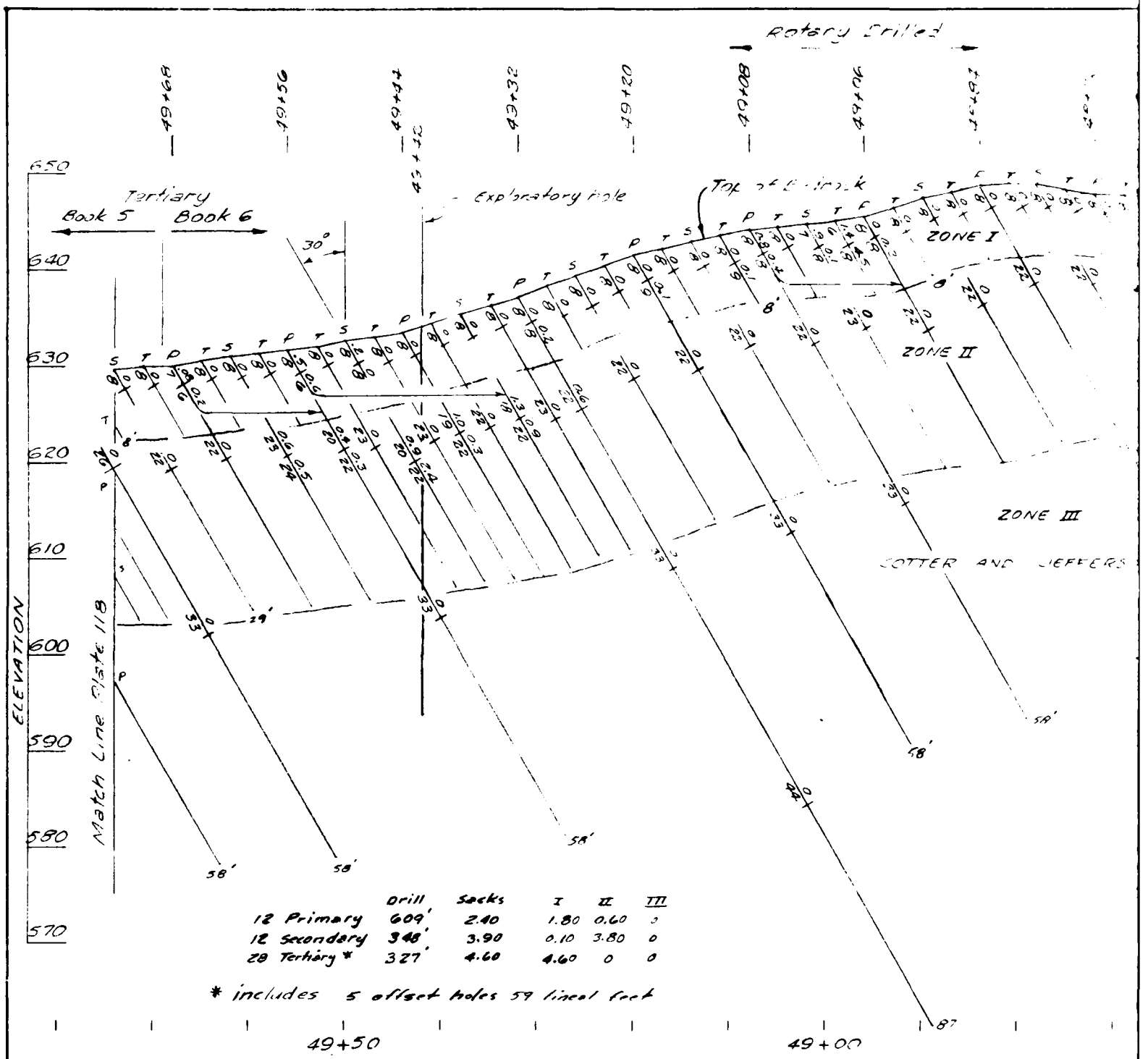
CONSTRUCTION FOUNDATION REPORT

LOCATION OF GROUT HOLES & KARST FEATURES IN CUTOFF TRENCH

Scale: AS SHOWN
Date: MARCH 1966
Sheet number:
File No. 0-12-9246

PLATE NO. 116



	Drill	Sacks	I	II	III
12 Primary	609'	2.40	1.80	0.60	0
12 Secondary	348'	3.90	0.10	3.80	0
28 Tertiary *	327'	4.60	4.60	0	0

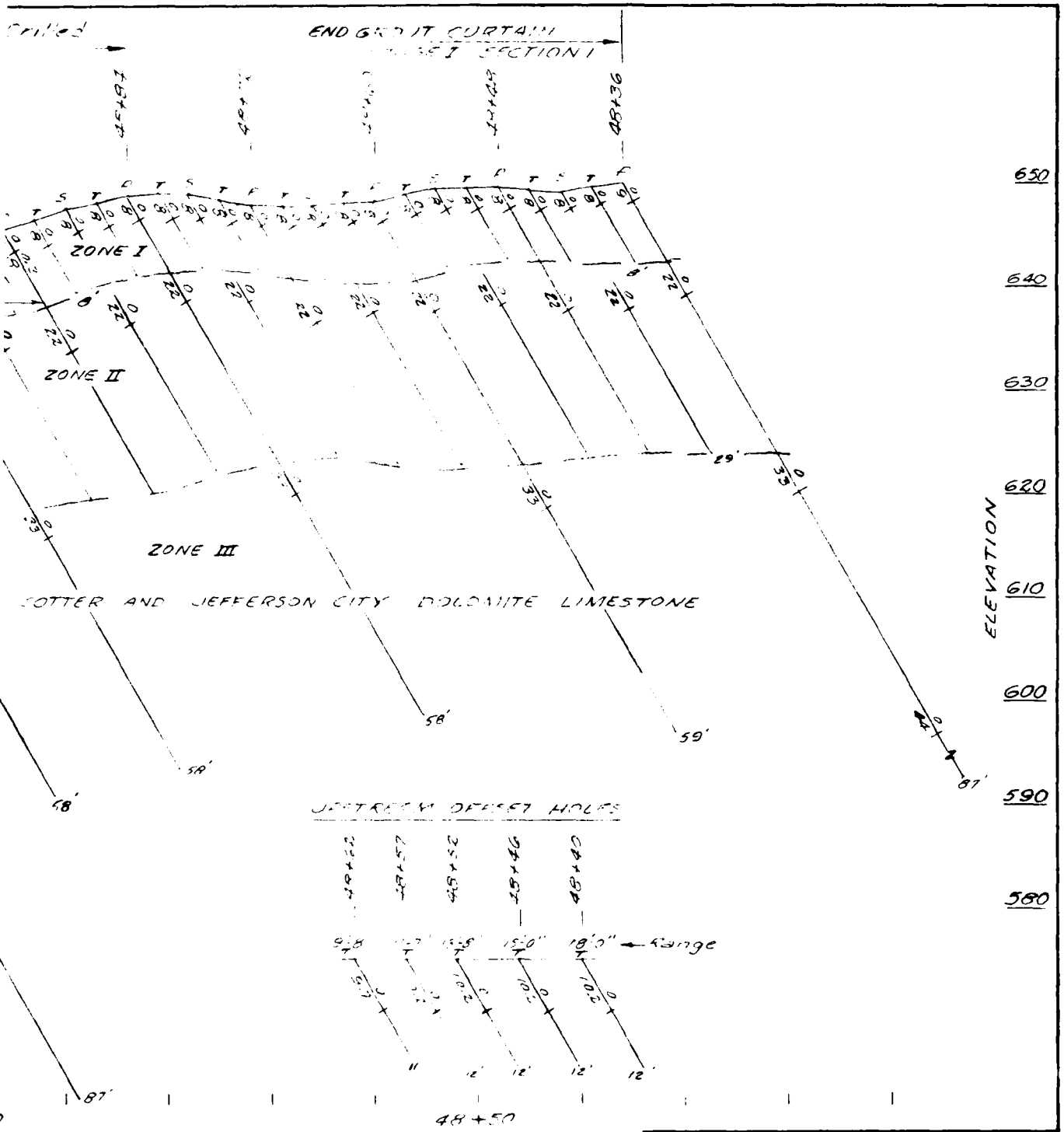
* includes 5 offset holes 59 lineal feet

LINE C STAGE I GROUT CURTAIN PROFILE STA 49+50
LOOKING DOWNSTREAM

Grout Line is on Dam Axis

0 10
SCALE IN FEET

For Le



OFILE STA 48+36 TO STA 49+74
WNSTREAM

10
IN FEET

For Legend see Plate 106

Revisions			
Symbol	Description	Date	Approved

U. S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

OSAGE RIVER, MISSOURI
HARRY S. TRUMAN DAM & RESERVOIR
CONSTRUCTION FOUNDATION REPORT

GROUT CURTAIN PROFILE, LINE C STA. 48+36 TO STA. 49+74

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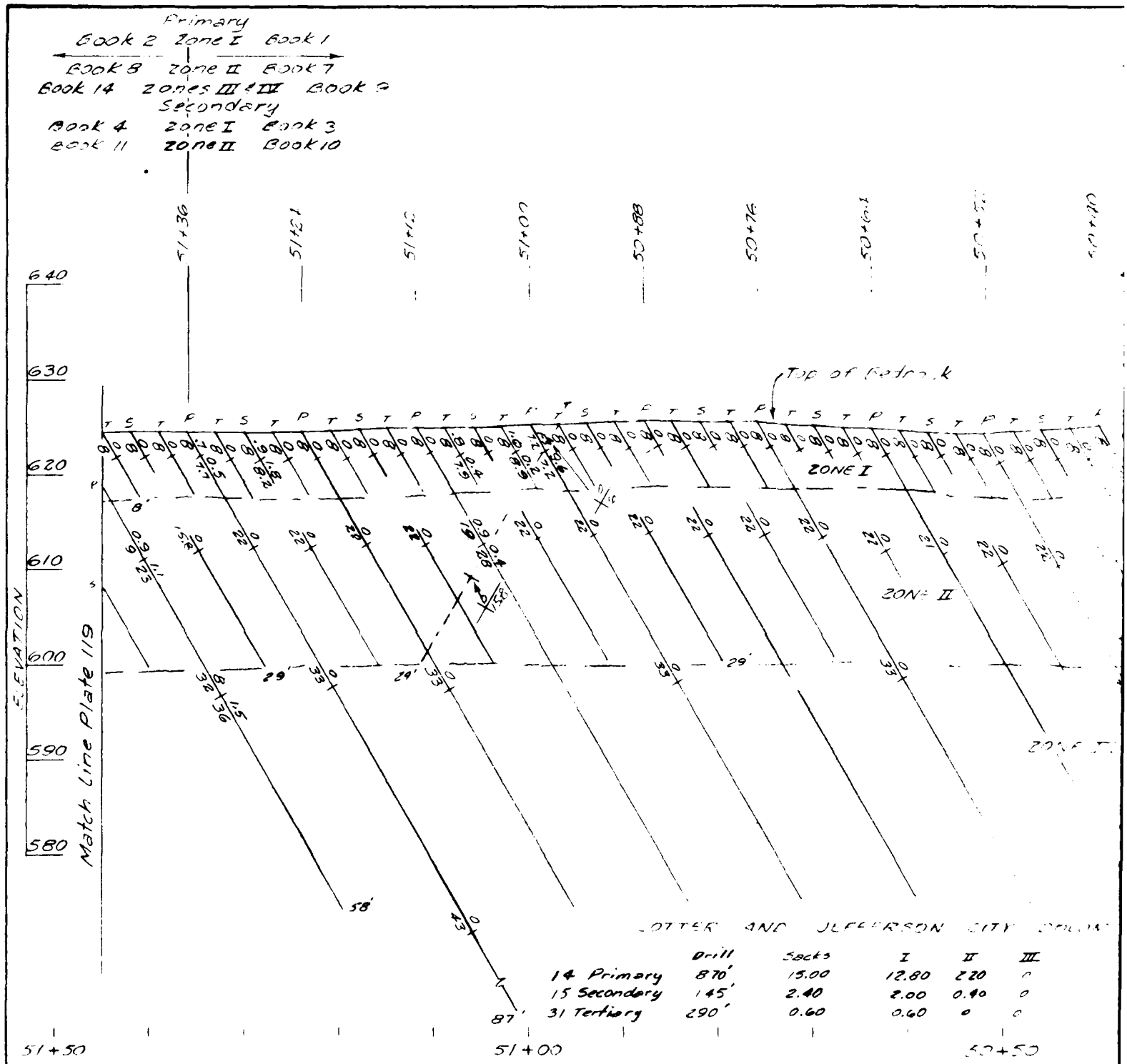
Checked by
Submitted by

Scale: AS SHOWN
Date: MARCH 1986
Sheet number:
Dwg. No.
No. 0-12-9247

PLATE NO. 117

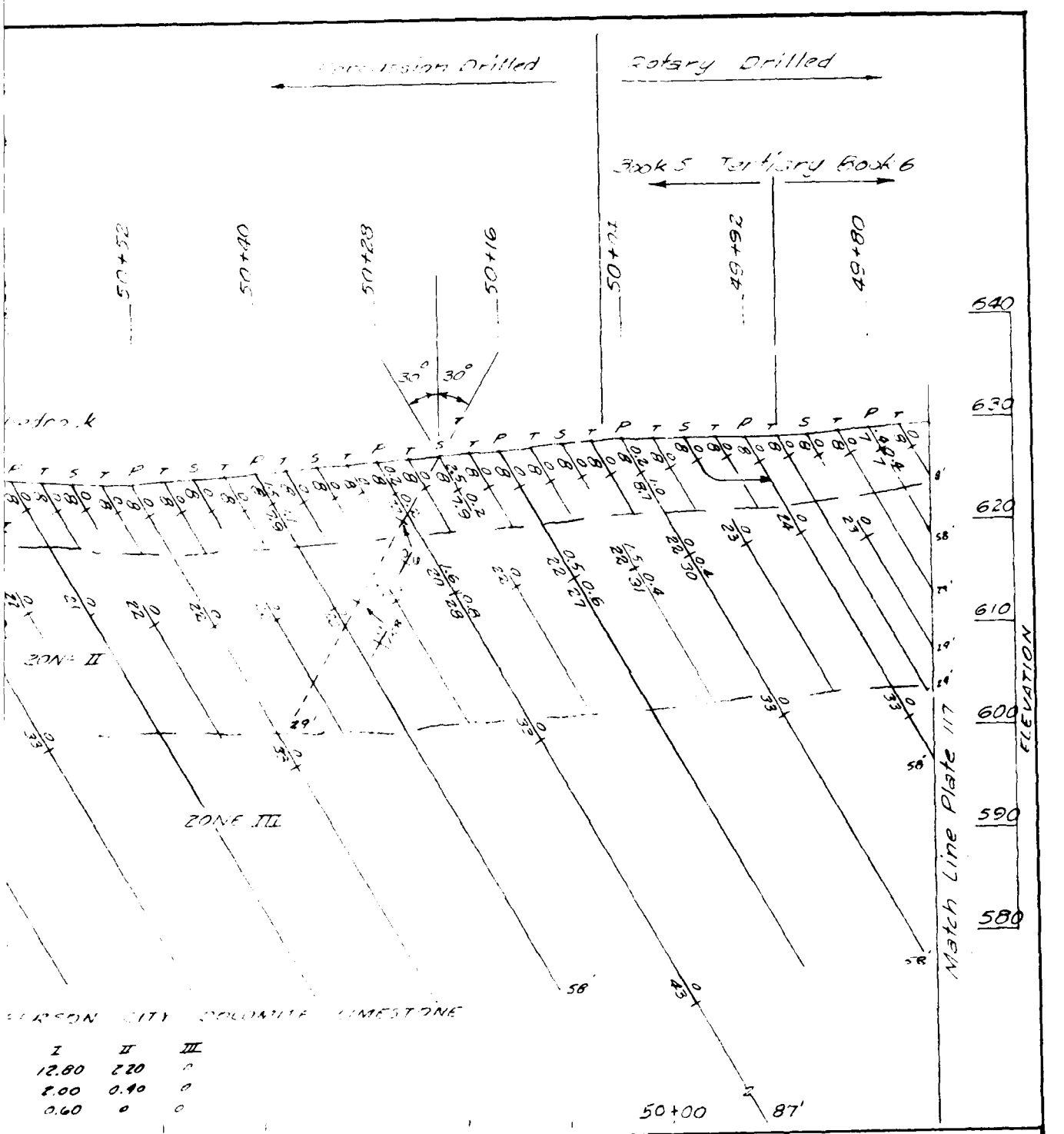


	Drill	Sacks	I	II	III
14 Primary	870'	15.00	12.80	2.20	0
15 Secondary	145'	2.40	2.00	0.40	0
31 Tertiary	290'	0.60	0.60	0	0

LINE C STAGE I GROUT CURTAIN PROFILE STA 49+74 TO
LOOKING DOWNSTREAM

Grout Line is on Dam Axis

0 10
SCALE IN FEET



I	II	III
12.80	2.20	0
2.00	0.40	0
0.60	0	0

47+50

STA 49+74 TO STA 51+45

TREAM

IN FEET

For Legend see Plate 106

Revisions			
Symbol	Descriptions	Date	Approved

U. S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

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CONSTRUCTION FOUNDATION REPORT

GROUT CURTAIN PROFILE, LINE C STA. 49+74 TO STA. 51+45

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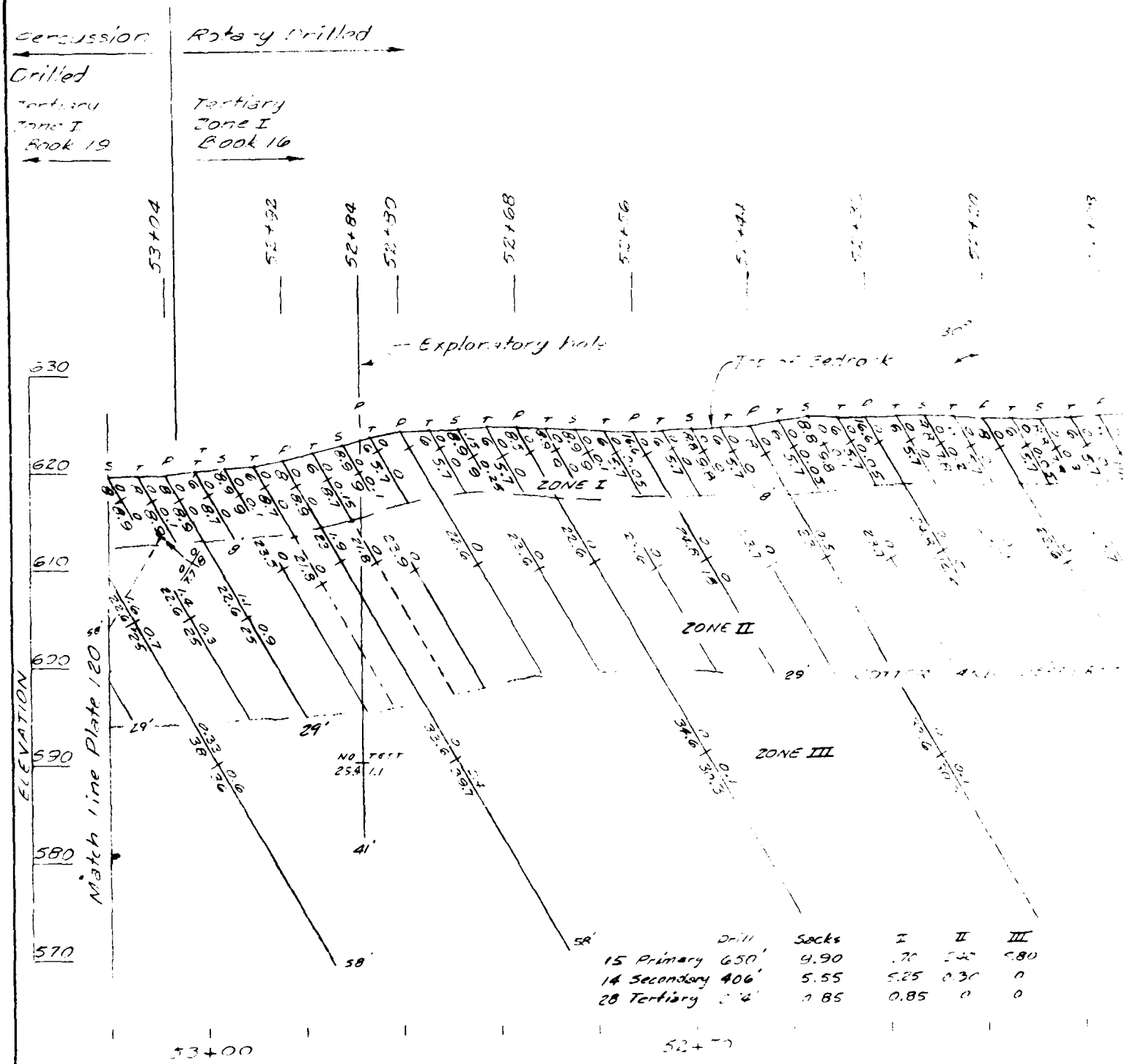
Scale: AS SHOWN
Date: MARCH 1966
Sheet number:
Dwg No.
File No. 0-12-9248

PLATE NO. 118

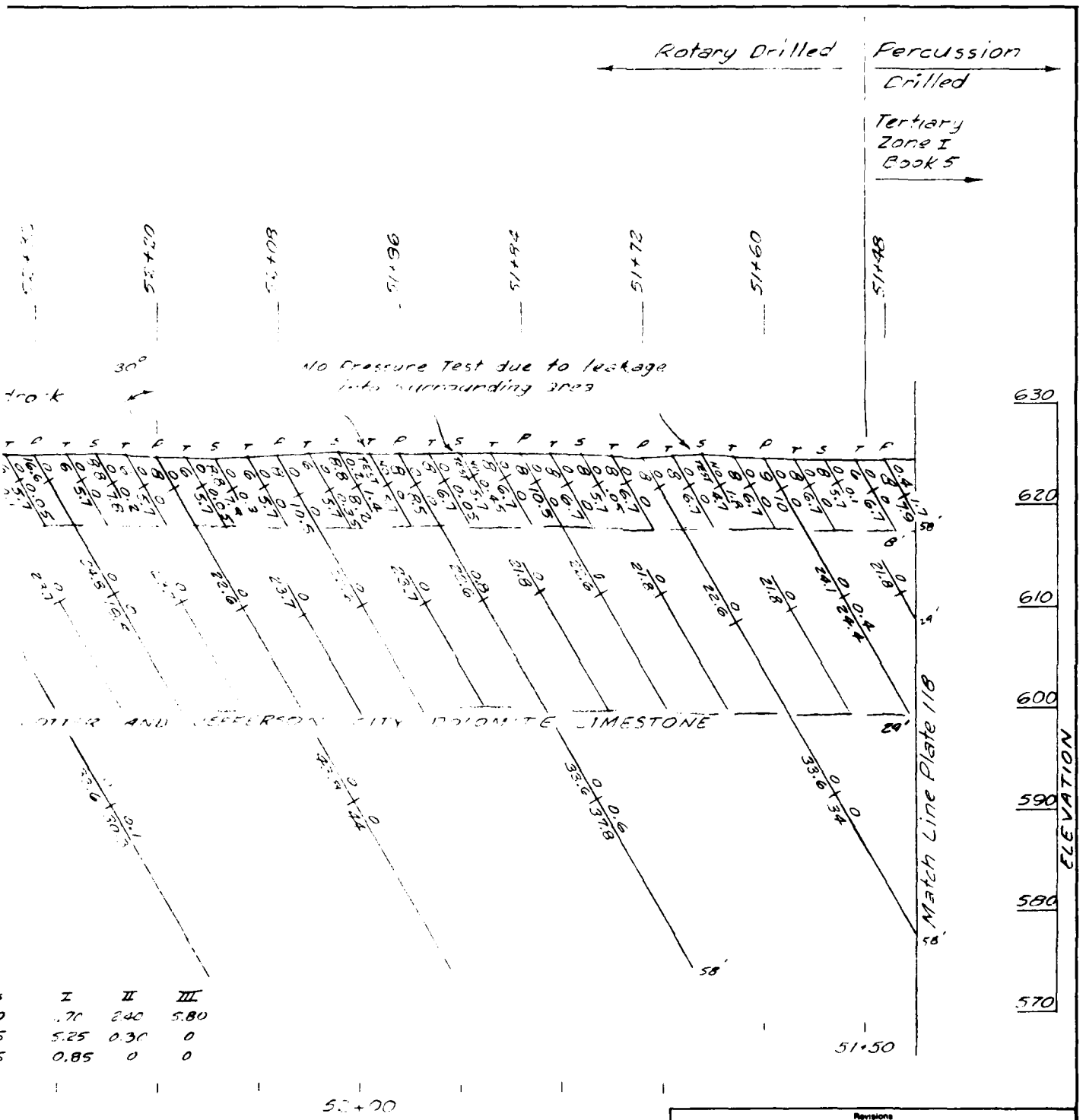


LINE C STAGE I GROUT CURTAIN PROFILE STA 51+45 TO
LOOKING DOWNSTREAM

Grout line is on Dam Axis

SCALE IN FEET

For L



	I	II	III
	.70	2.40	5.80
	5.25	0.30	0
	0.85	0	0

LE STA 51+45 TO STA 53+10

NSTREAM

10

E IN FEET

For Legend see Plate 106

Revisions			
Symbol	Descriptions	Date	Approved

U S ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

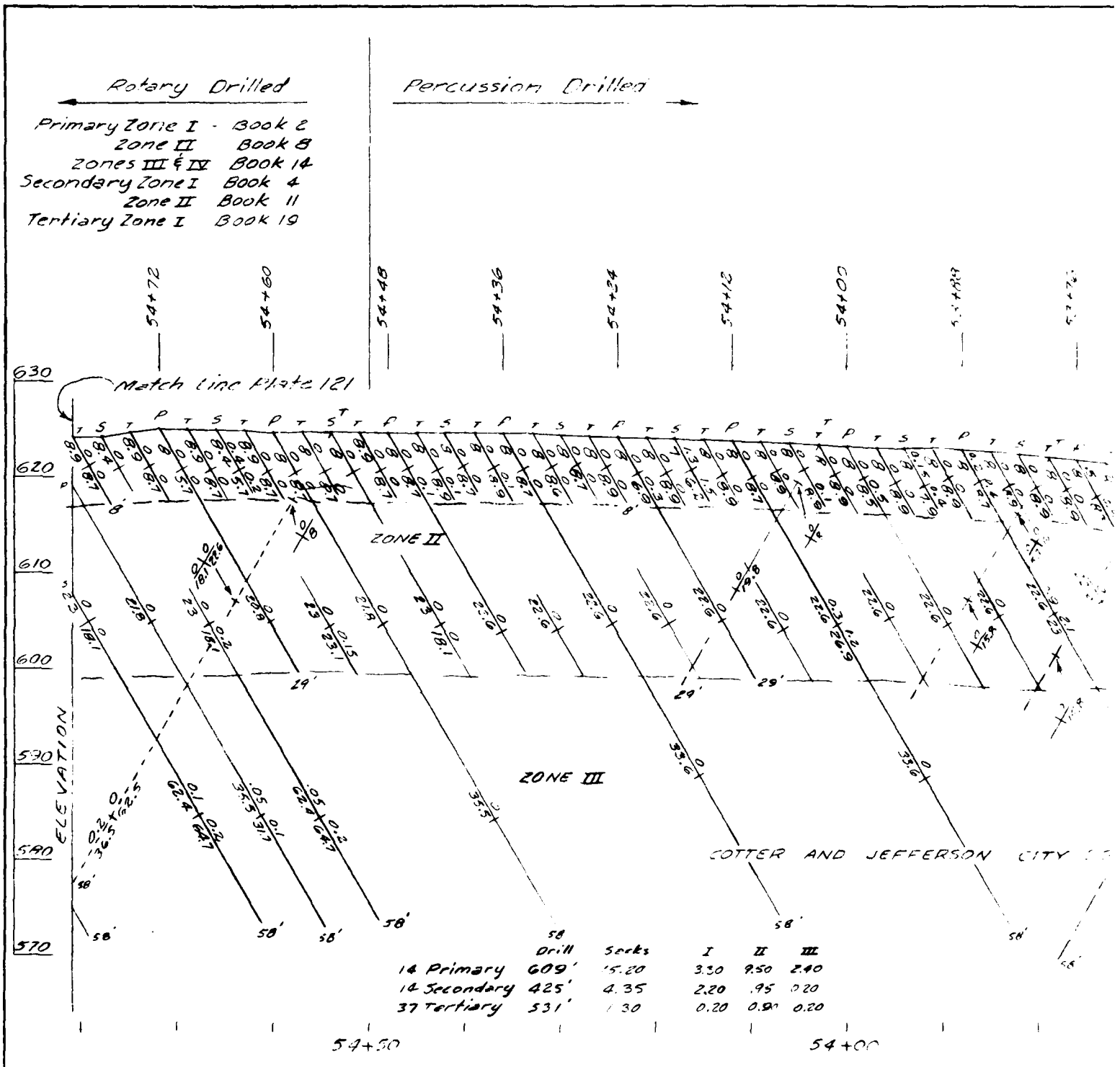
Designed by
Drawn by
Checked by
Submitted by

OSAGE RIVER, MISSOURI
HARRY S. TRUMAN DAM & RESERVOIR
CONSTRUCTION FOUNDATION REPORT

GROUT CURTAIN PROFILE
LINE C
STA. 51+45 TO STA. 53+10

Scale AS SHOWN
Date MARCH 1966
File No. 0-12-9249

PLATE NO. 119

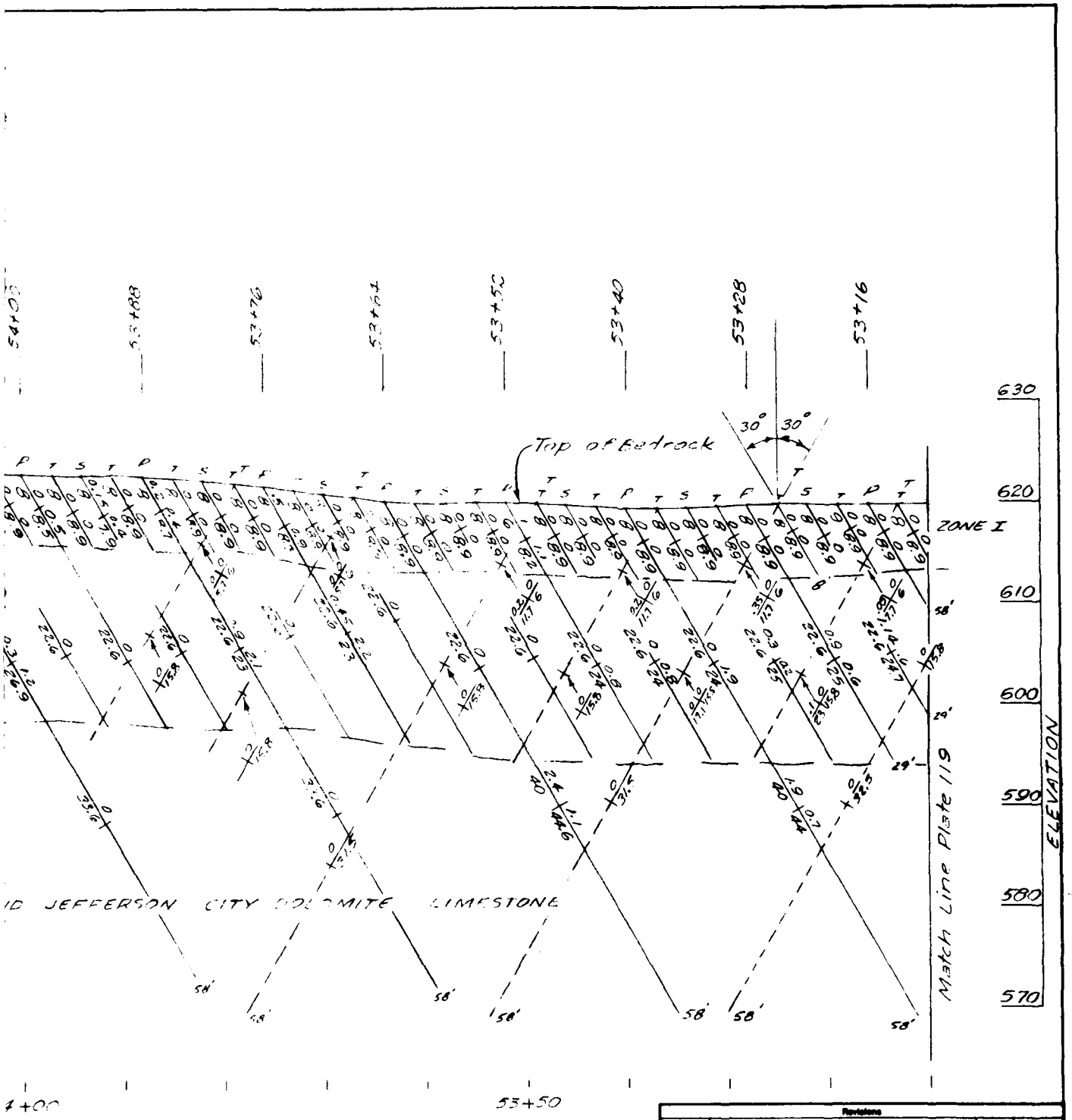


LINE C STAGE I GROUT CURTAIN PROFILE STA 53+10 TO
LOOKING DOWNSTREAM

Grout Line is on Dam Axis

0 10
SCALE IN FEET

Fig 1.



E STA 53+10 TO STA 54+81

VSTREAM

10

1 FEET

For Legend see Plate 106

Revisions			
Symbol	Descriptions	Date	Approved

U. S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

OSAGE RIVER, MISSOURI
HARRY S. TRUMAN DAM & RESERVOIR
CONSTRUCTION FOUNDATION REPORT

GROUT CURTAIN PROFILE
LINE C
STA. 53+10 TO STA. 54+81

Designed by
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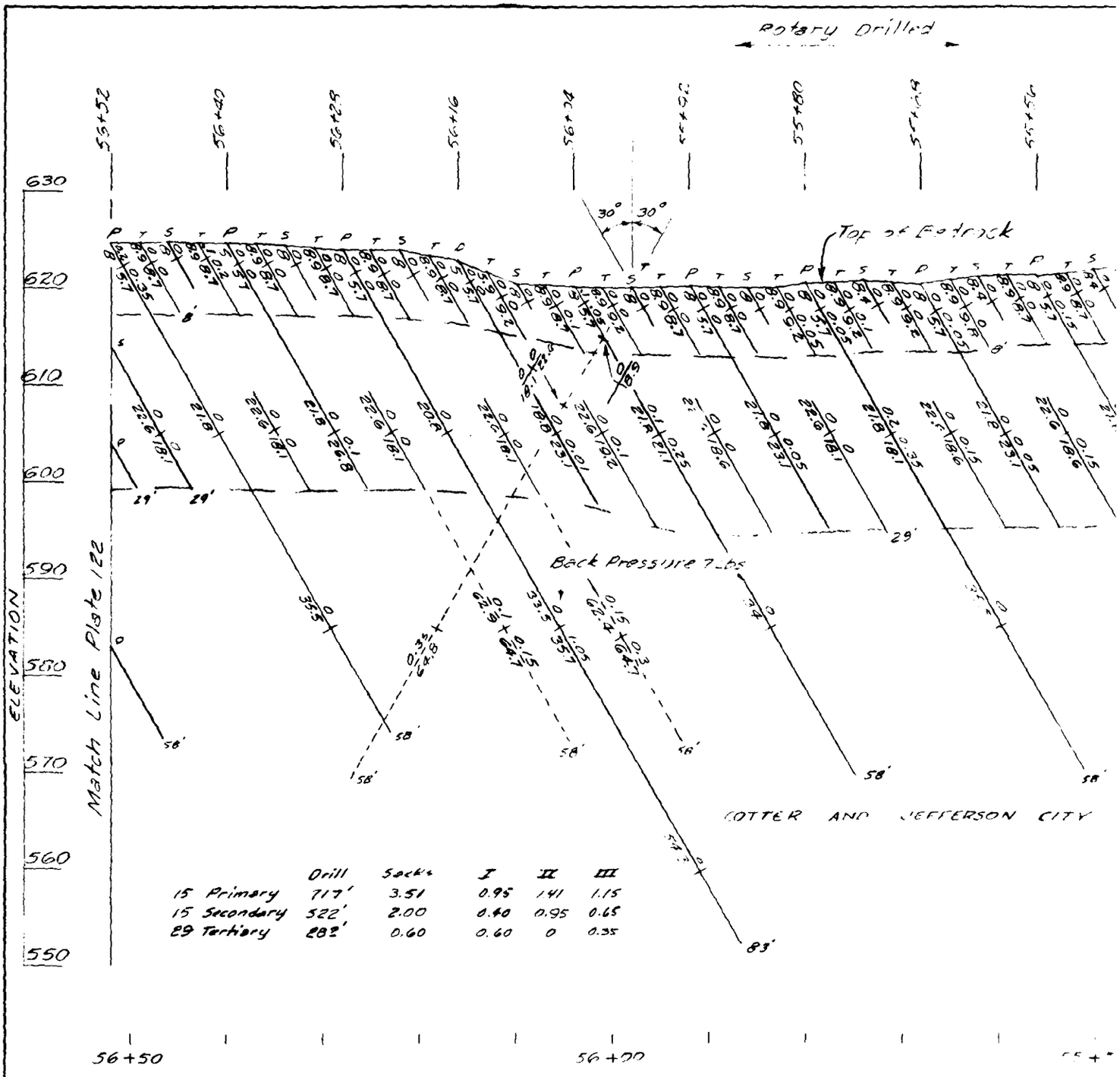
Checked by
Submitted by

Scale AS SHOWN
Date MARCH 1986
Sheet number
File No. 0-12-9250

PLATE NO. 120



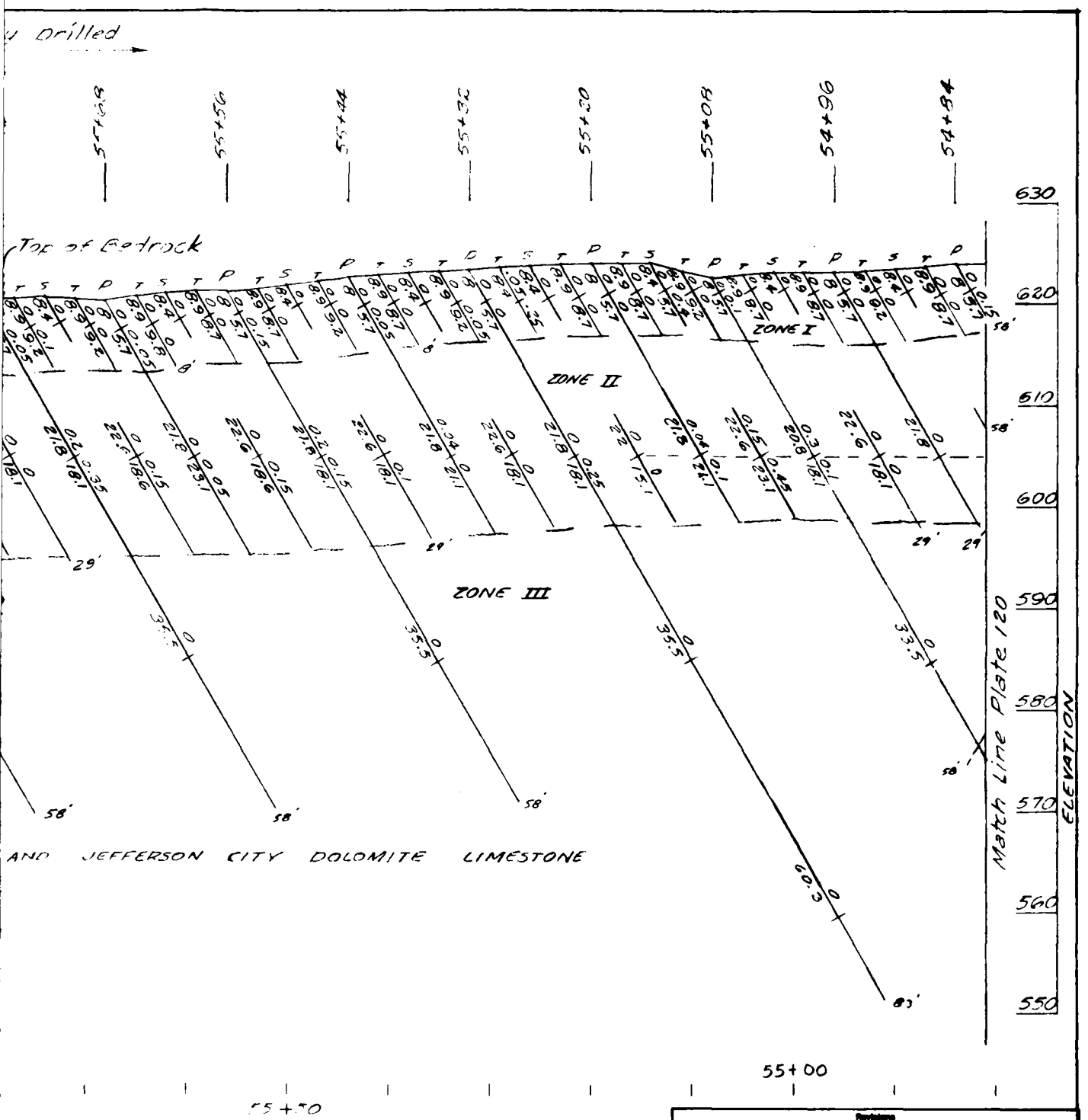
	Drill	Sacks	I	II	III
15 Primary	717'	3.51	0.95	1.41	1.15
15 Secondary	522'	2.00	0.40	0.95	0.65
29 Tertiary	282'	0.60	0.60	0	0.35

LINE C STAGE I GROUT CURTAIN PROFILE STA 54+81 TO
LOOKING DOWNSTREAM

Grout Line is on Dam Axis

SCALE IN FEET

Fol 16



LE STA 54+81 TO STA 56+52
DOWNSTREAM

SCALE IN FEET

For legend see Plate 106

Revisions			
Symbol	Descriptions	Date	Approved

U. S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

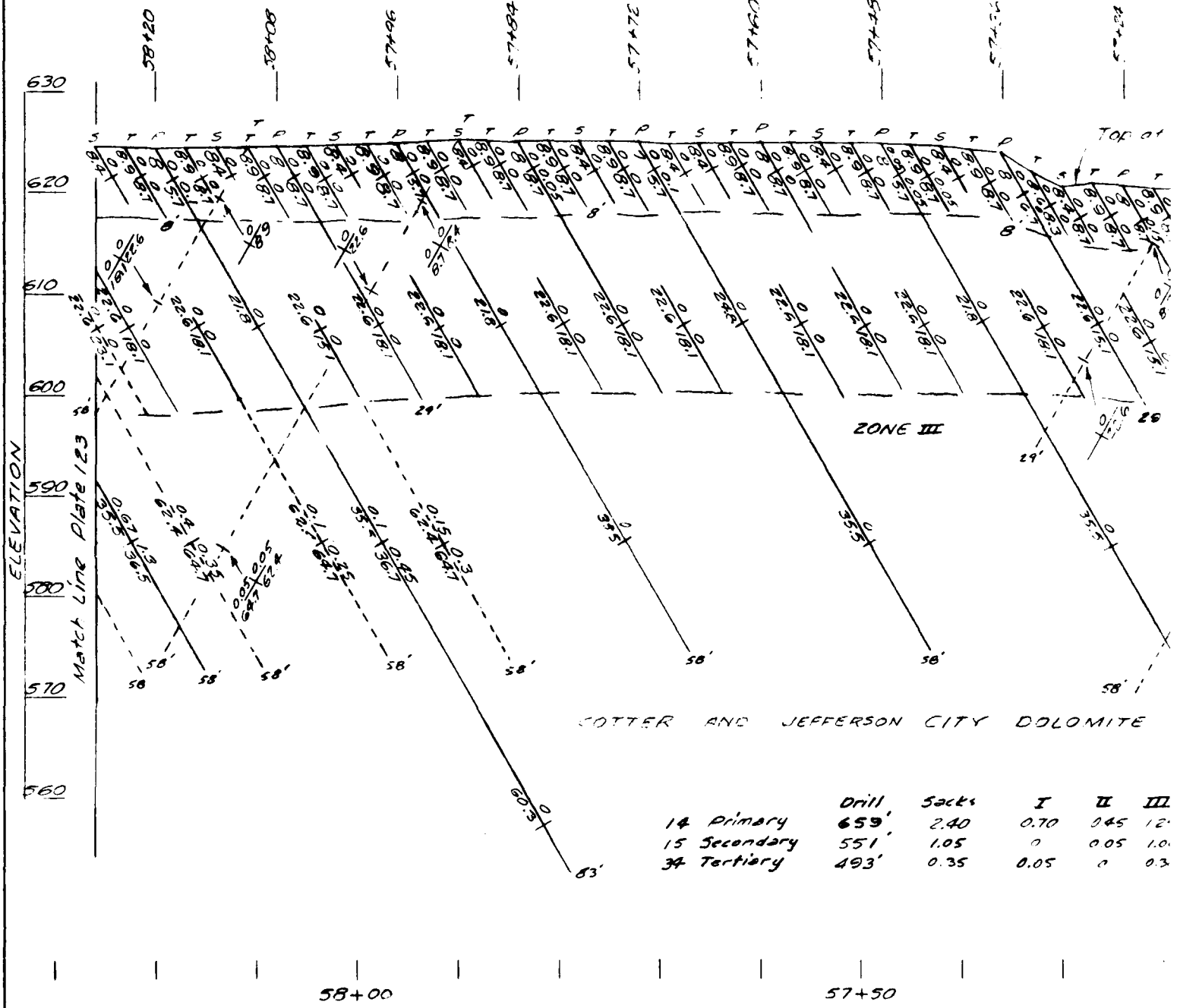
OSAGE RIVER, MISSOURI
HARRY S. TRUMAN DAM & RESERVOIR
CONSTRUCTION, FOUNDATION REPORT

GROUT CURTAIN PROFILE
LINE C
STA. 54+81 TO STA. 56+52

Designed by:
Drawn by:
Checked by:
Submitted by:

Scale: AS SHOWN
Date: MARCH 1966
Sheet number:
Dwg. No.
No. 0-12-9251

PLATE NO. 121



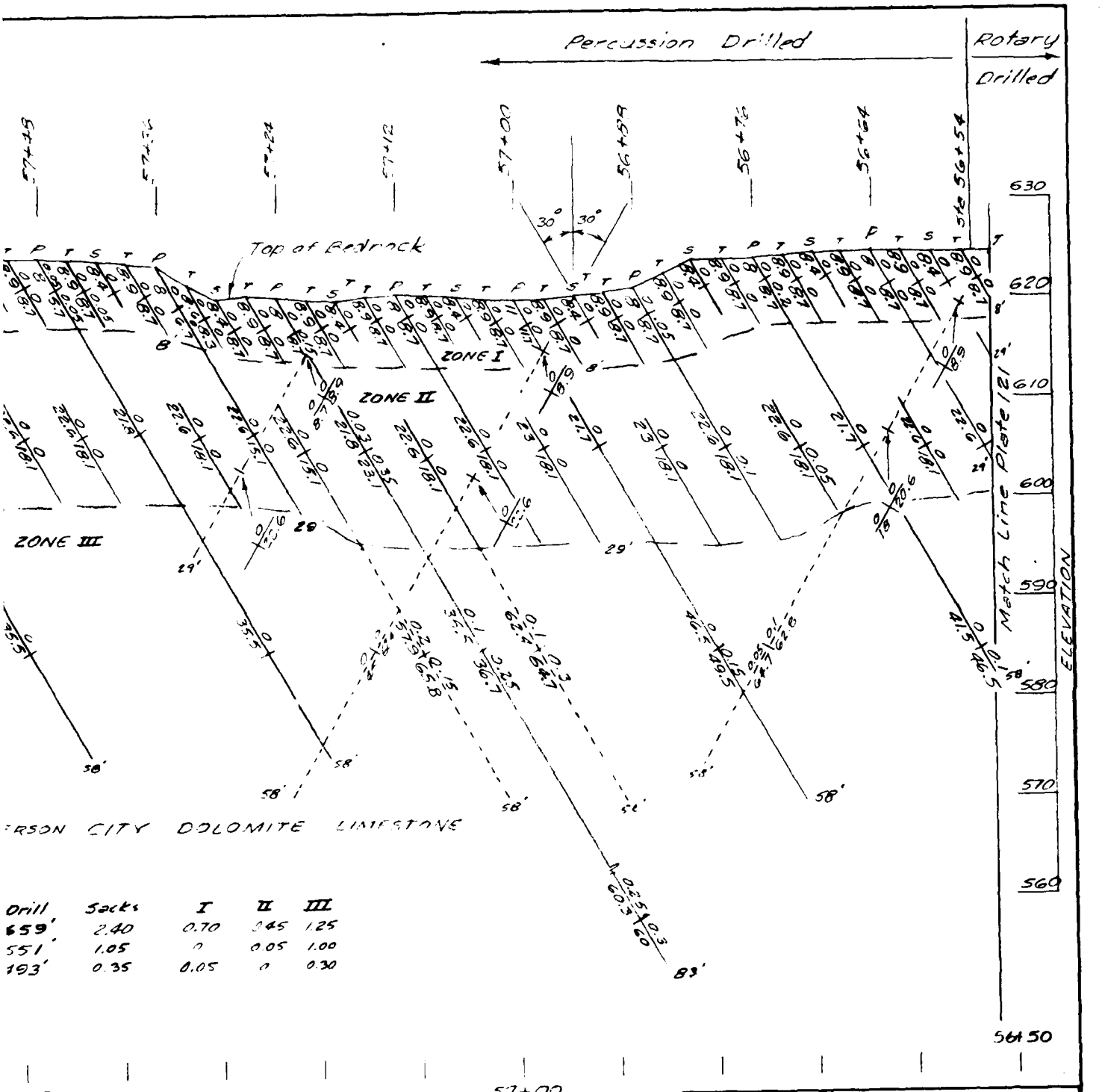
	Drill	Sacks	I	II	III
14 Primary	659'	2.40	0.70	0.45	12
15 Secondary	551'	1.05	0	0.05	1.0
34 Tertiary	493'	0.35	0.05	0	0.3

LINE C STAGE I GROUT CURTAIN PROFILE STA 56+52 TO
LOOKING DOWNSTREAM

Grout Line is on Dam Axis

0 10
SCALE IN FEET

For Leg



ERSON CITY DOLOMITE LIMESTONE

Drill	Sacks	I	II	III
659'	2.40	0.70	0.45	1.25
551'	1.05	0	0.05	1.00
193'	0.35	0.05	0	0.30

FILE STA 56+52 TO STA 58+26 DOWNSTREAM

0 10
SCALE IN FEET

For Legend see Plate 106

Revisions			
Symbol	Descriptions	Date	Approved

U. S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

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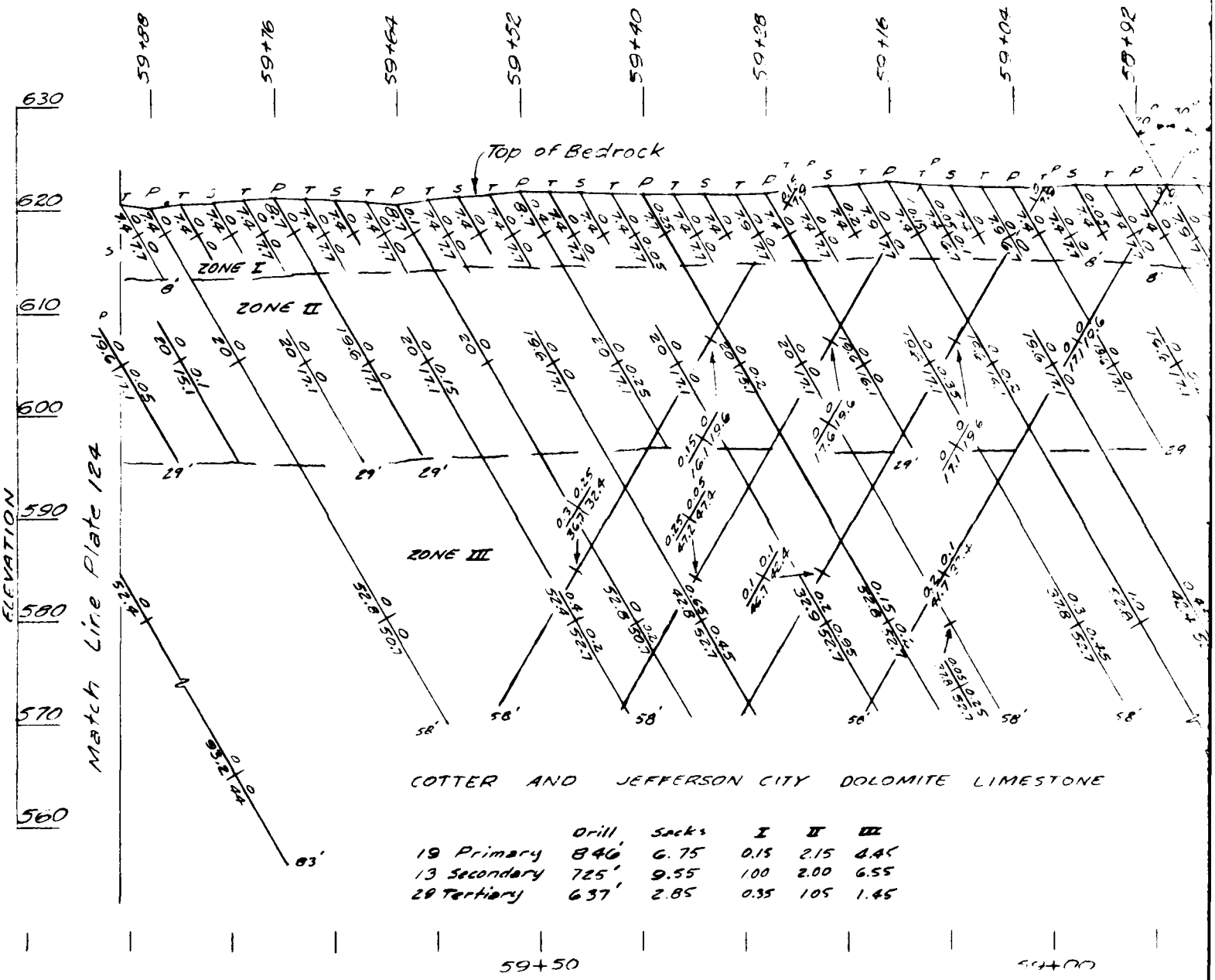
OSAGE RIVER, MISSOURI
HARRY S. TRUMAN DAM & RESERVOIR
CONSTRUCTION FOUNDATION REPORT

GROUT CURTAIN PROFILE
LINE C
STA. 56+52 TO STA. 58+26

Scale: AS SHOWN
Date: MARCH 1966
Sheet number:
Dwg. No.
File No. 0-12-9252

PLATE NO. 122



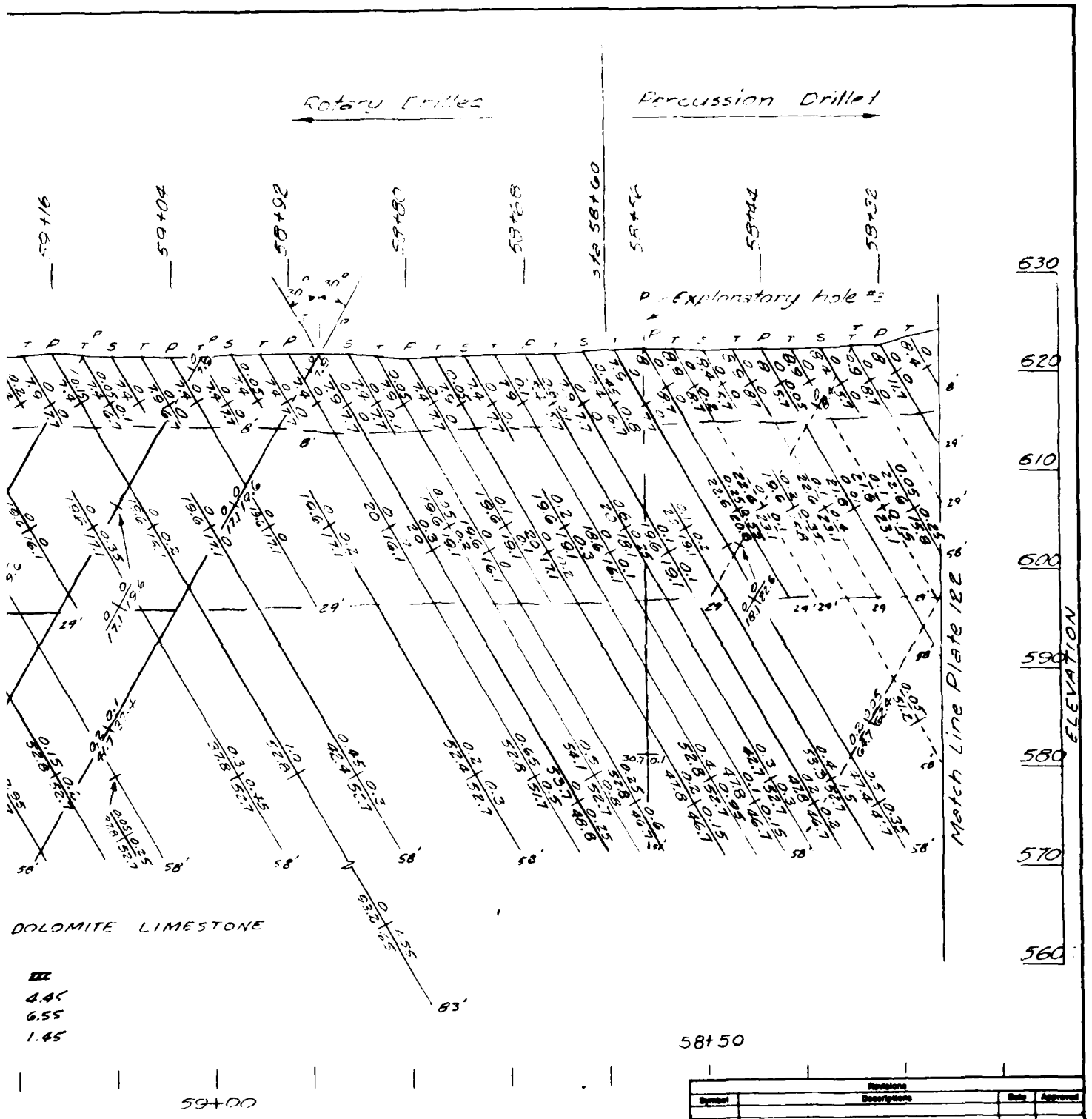
	Drill	Sacks	I	II	III
19 Primary	846'	6.75	0.15	2.15	4.45
13 Secondary	725'	9.55	1.00	2.00	6.55
29 Tertiary	637'	2.85	0.35	1.05	1.45

LINE C STAGE I GROUT CURTAIN PROFILE STA 58+26 TO S
LOOKING DOWNSTREAM

Grout Line is on Dam Axis

0 10
SCALE IN FEET

For Legend s



FILE STA 58+26 TO STA 59+91
UPSTREAM

0 10
SCALE IN FEET

For Legend see Plate 106

Revisions			
Symbol	Descriptions	Date	Approved

U. S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

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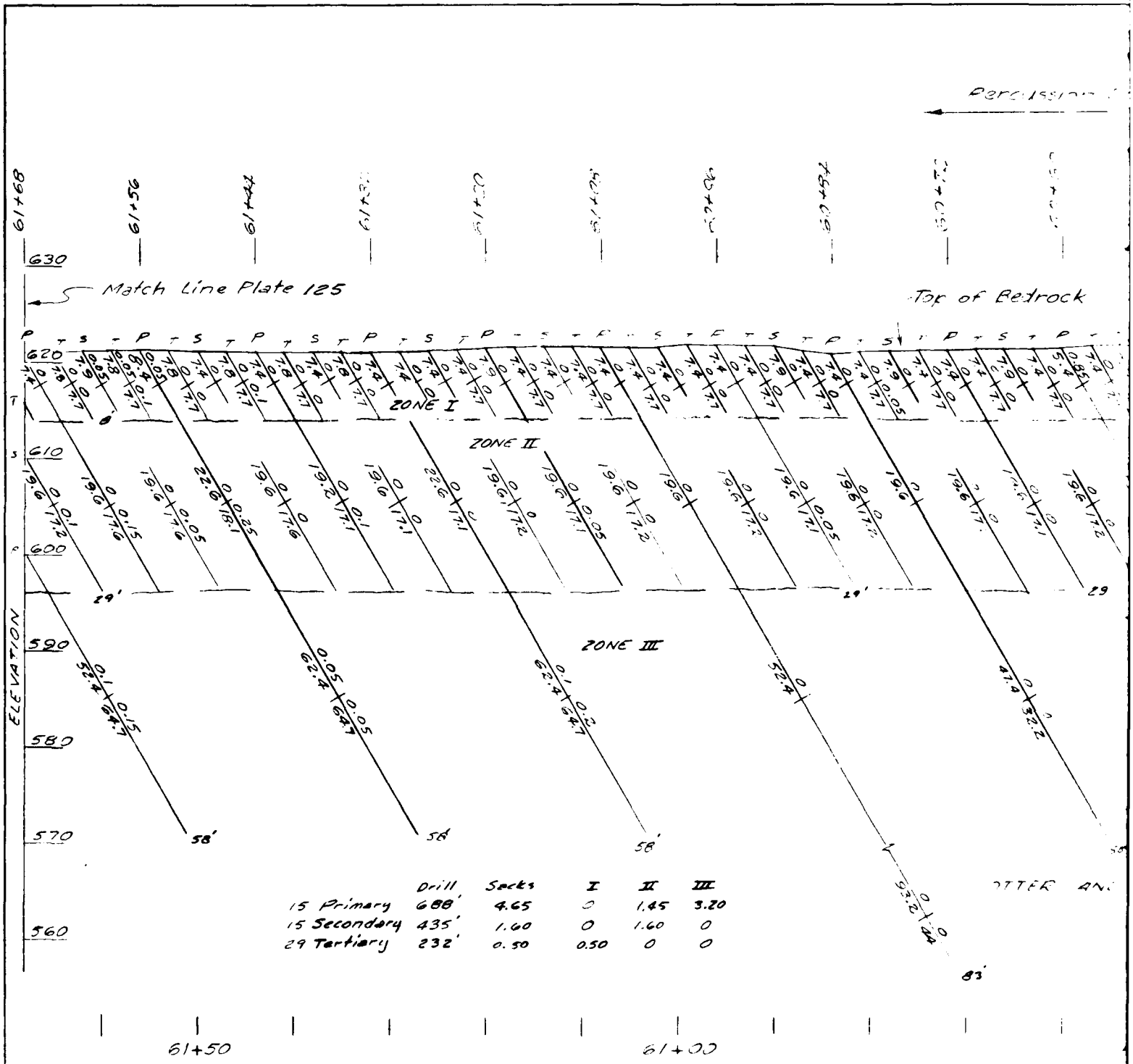
GRAND RIVER, MISSOURI
HARRY S. TRUMAN DAM & RESERVOIR
Section CONSTRUCTION FOUNDATION REPORT

GROUT CURTAIN PROFILE
LINE C
STA. 58+26 TO STA. 59+91

Scale: AS SHOWN
Date: MARCH 1965
Sheet number:
No. 012-9253

PLATE NO. 123

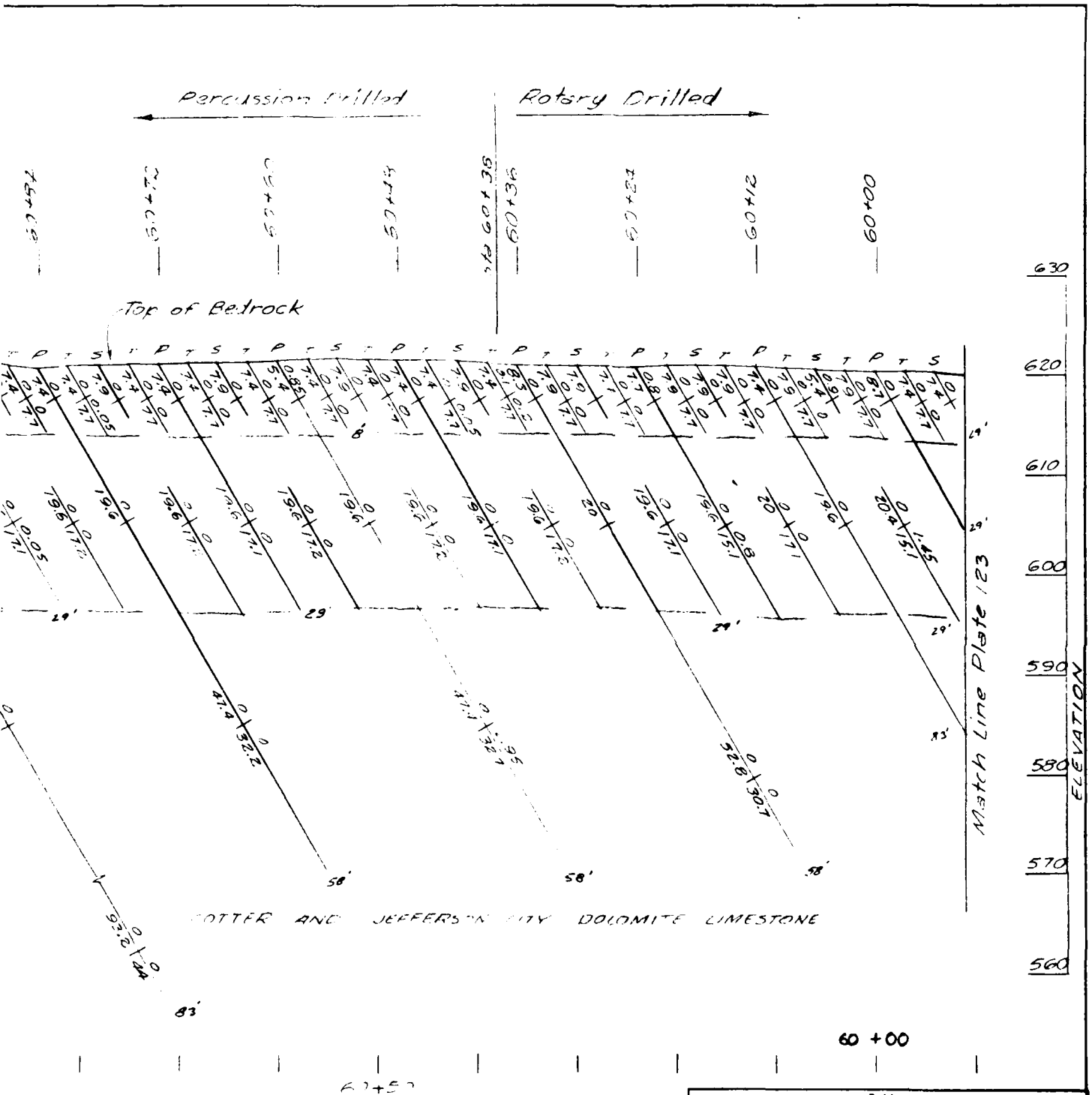


	Drill	Sacks	I	II	III
15 Primary	688'	4.65	0	1.45	3.20
15 Secondary	435'	1.60	0	1.60	0
29 Tertiary	232'	0.50	0.50	0	0

LINE C STAGE I GROUT CURTAIN PROFILE STA 59+91 TO 61+68 LOOKING DOWNSTREAM

Grout line is on Dam Axis

For Legend



Revisions			
Symbol	Descriptions	Date	Approved

U. S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

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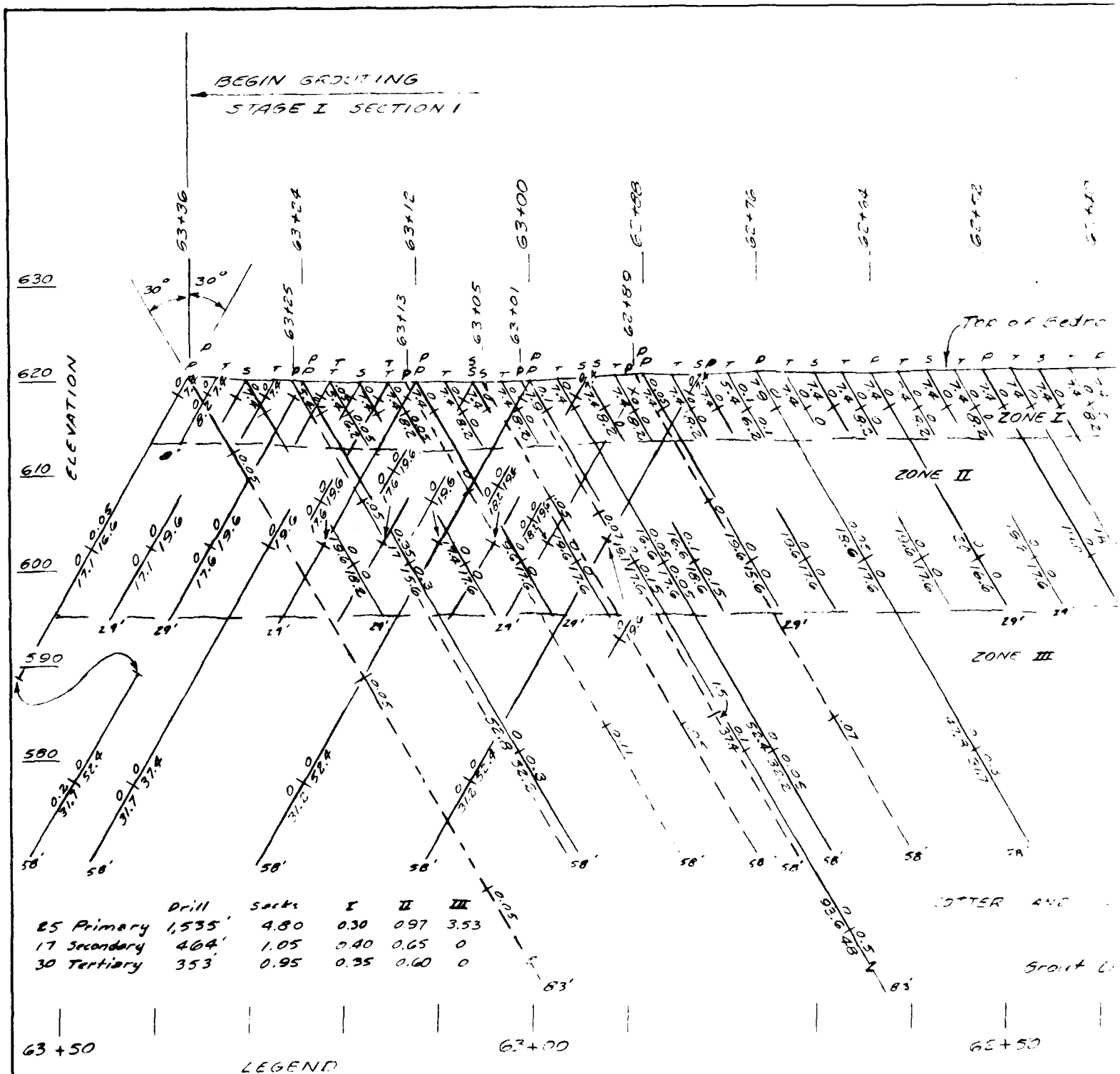
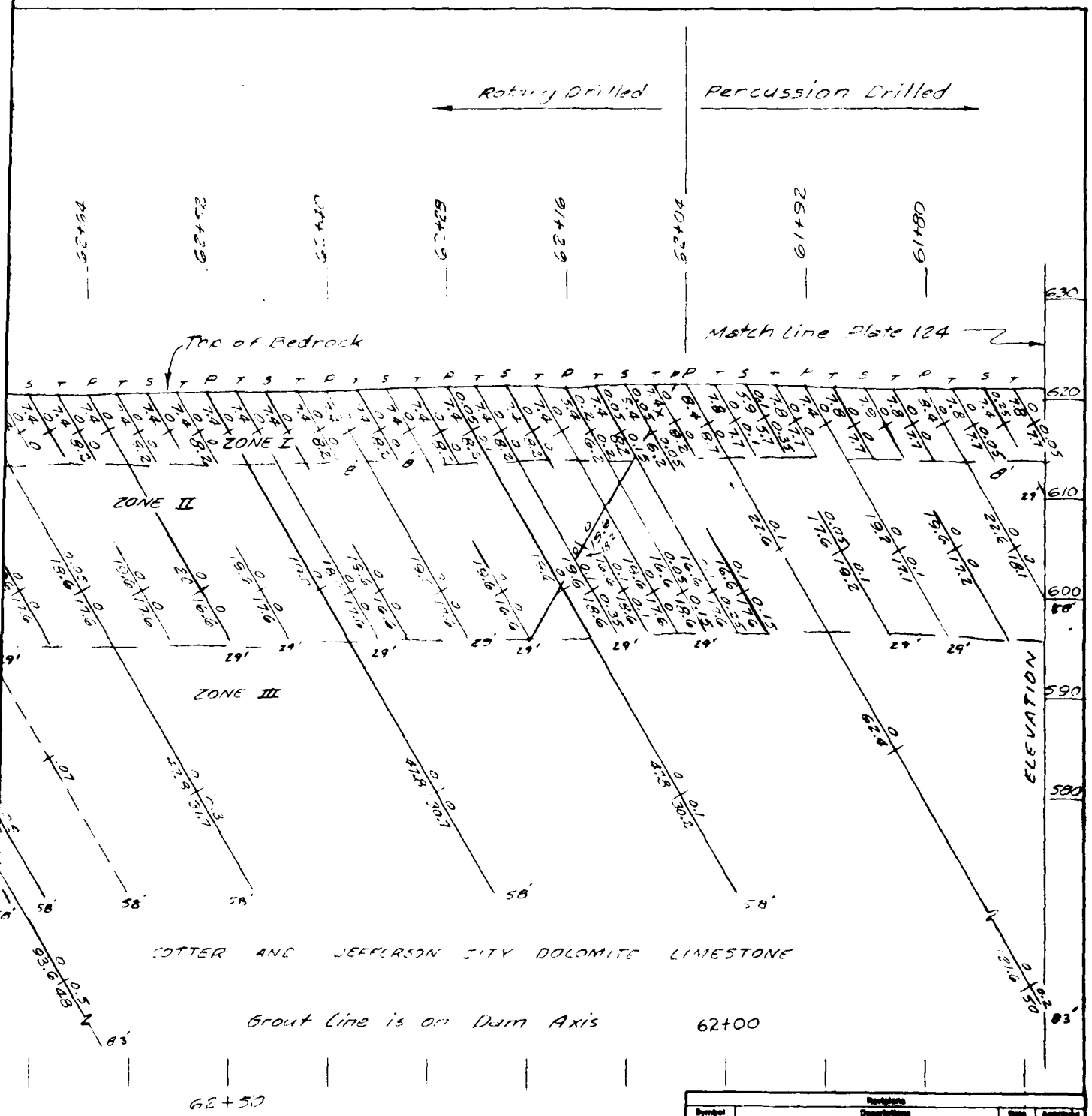
HARRY S. TRUMAN DAM & RESERVOIR
CONSTRUCTION FOUNDATION REPORT

GROUT CURTAIN PROFILE
LINE C
STA. 59+91 TO STA. 61+68

Scale AS SHOWN
Date MARCH 1966
No. 0-12-9254

PLATE NO. 124


BEGIN GROUTING
STAGE I SECTION I
ELEVATION
630
620
610
600
590
580
30°
30°
63+36
63+24
63+12
63+00
62+88
62+76
62+64
62+52
63+25
63+13
63+05
63+01
62+89
Top of Bedro
ZONE I
ZONE II
ZONE III
29'
58'
63'
63+50
63+00
62+50
Drill Sacks I II III
25 Primary 1,535' 4.80 0.30 0.97 3.53
17 Secondary 464' 1.05 0.40 0.65 0
30 Tertiary 353' 0.95 0.35 0.60 0
LEGEND
P Primary holes
S Secondary holes
T Tertiary holes
Redrill hole
Pressure test Psi
Water take cu. ft per min
Packer
Grout Pressure Psi
Grout take sacks of cement
STAGE I LINE C
GROUT CURTAIN PROFILE STA
LOOKING DOWNSTREAM



STAGE I LINE C
PROFILE STA 61+68 TO STA 63+36
NG DOWNSTREAM

0 10
SCALE IN FEET

Symbol	Description	Date	Approved

U. S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

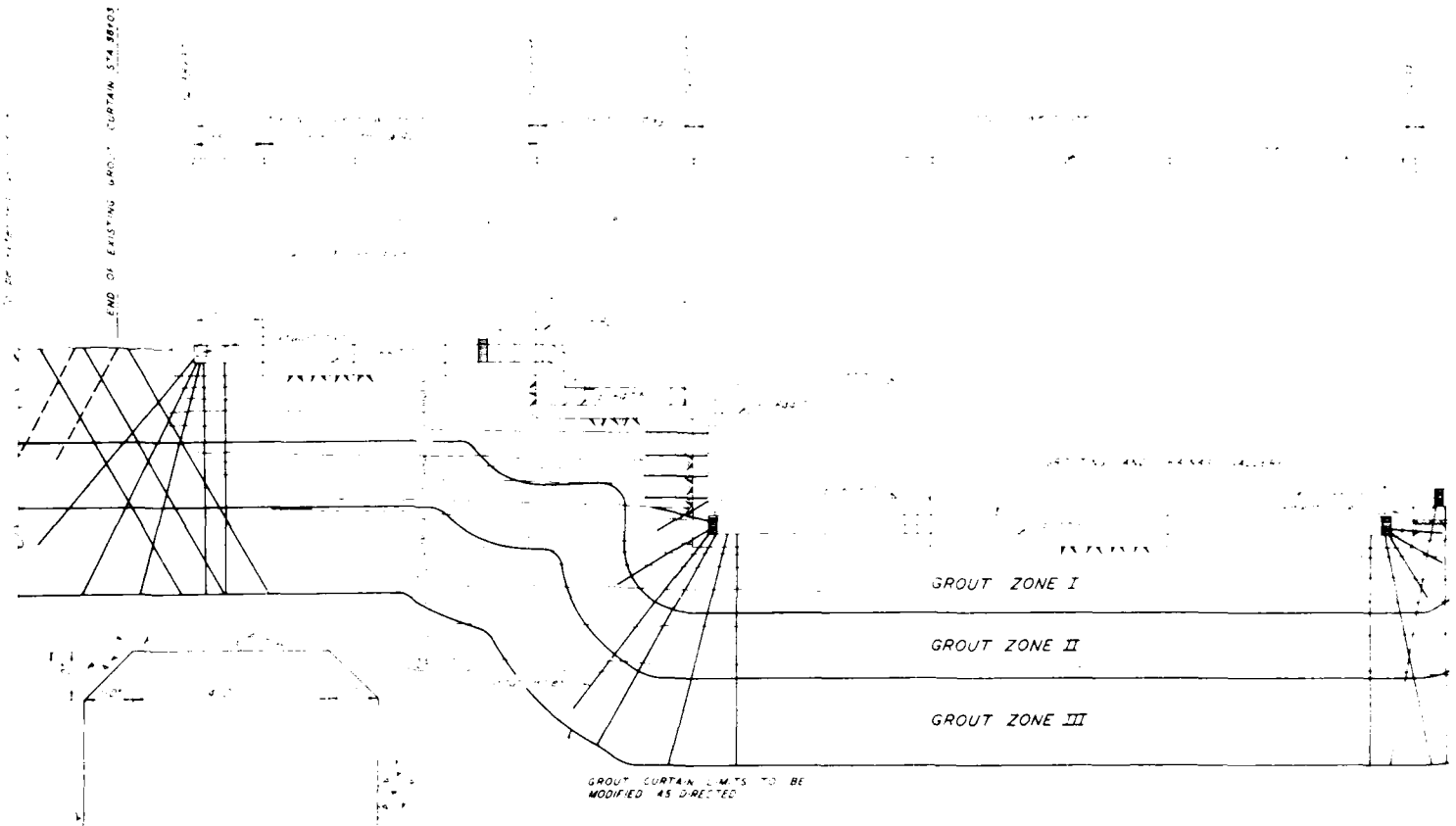
GRAND RIVER, MISSOURI
HARRY S. TRUMAN DAM & RESERVOIR
CONSTRUCTION FOUNDATION REPORT

GROUT CURTAIN PROFILE
LINE C
STA. 61+68 TO STA. 63+36

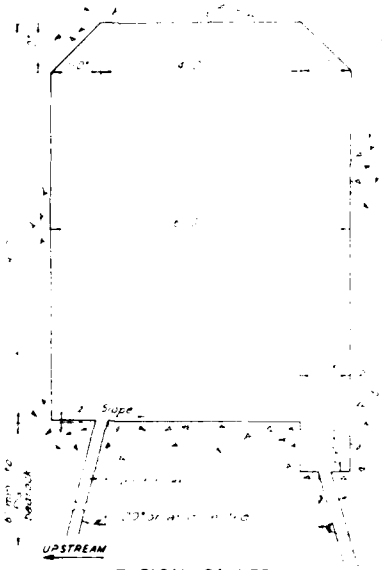
Scale: AS SHOWN
Date: MARCH 1980

Designed by
Drawn by
Checked by
Submitted by

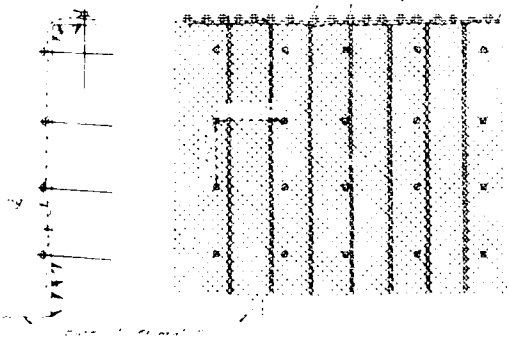
PLATE NO. 125



GROUT CURTAIN FOR SPILLWAY-POWERHOUSE LOOKING



TYPICAL GALLERY



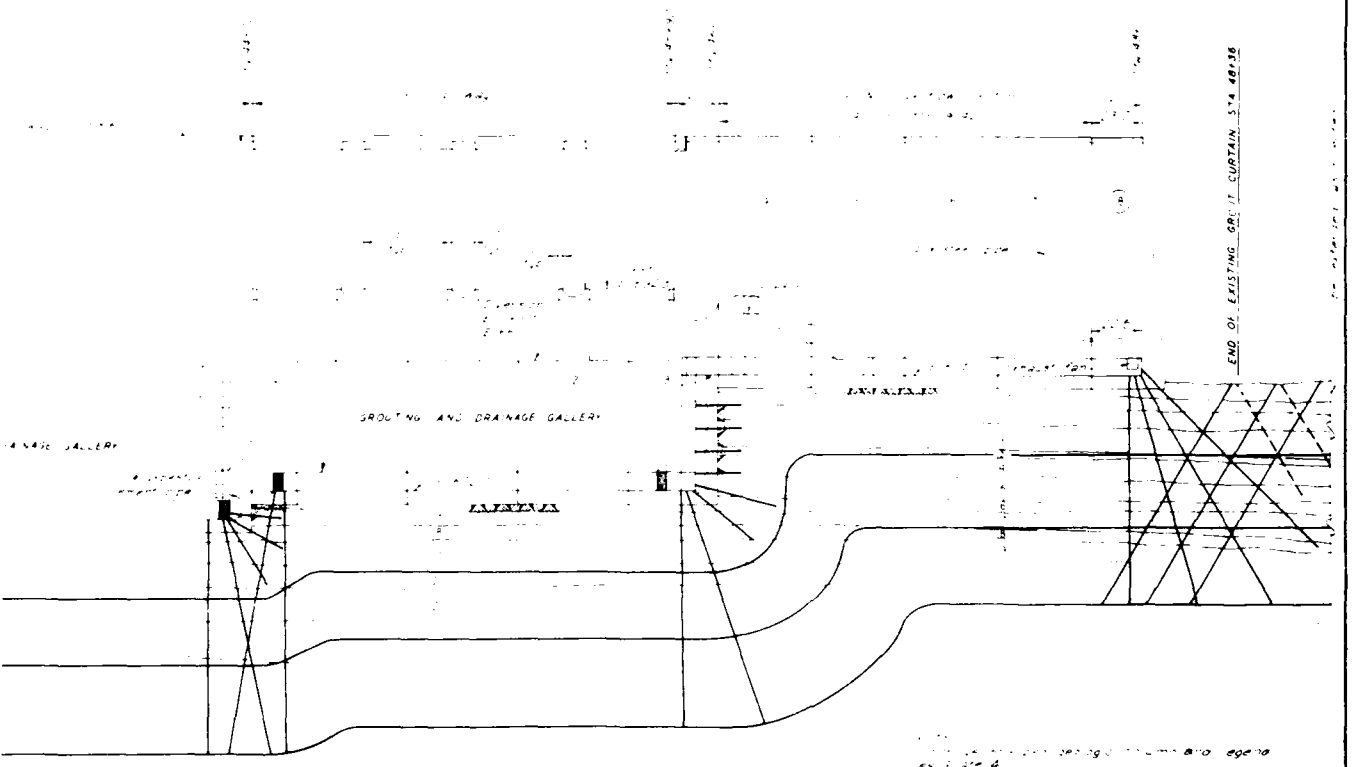
SECTION ELEVATION

INSTALLATION OF DRAPED FENCING

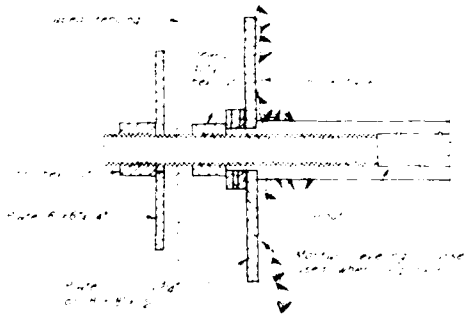
DETAIL-AT
ON SHO

DRAWINGS IN THIS FOLIO HAVE BEEN REDUCED TO ONE HALF THE ORIGINAL SCALE

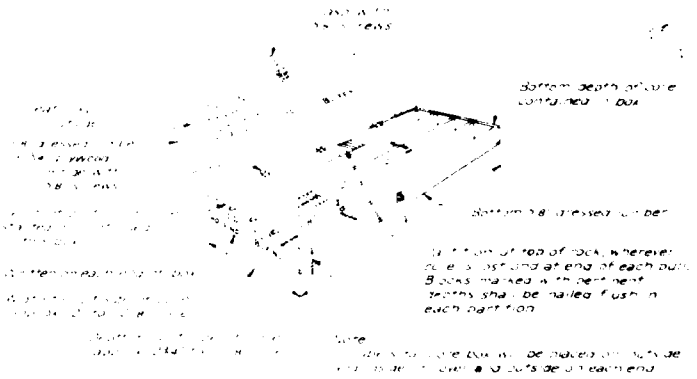
DETAIL-ATTAC
ON DRA



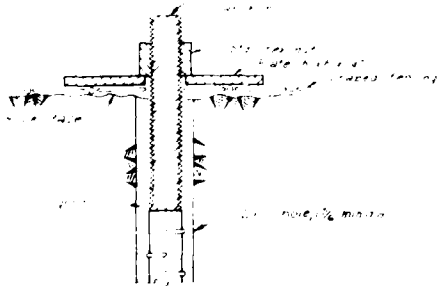
LWAY-POWERHOUSE LOOKING UPSTREAM



DETAIL-ATTACHMENT OF DRAPED FENCING
ON SHORT PERFORATED SLEEVE BOLT



CORE BOX DETAILS
(FOR EXPLORATORY DRILLING)



DETAIL ATTACHMENT OF DRAPED FENCING
ON DRAPED FENCING ANCHOR

Symbol	Revisions Descriptions	Date	Approved

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

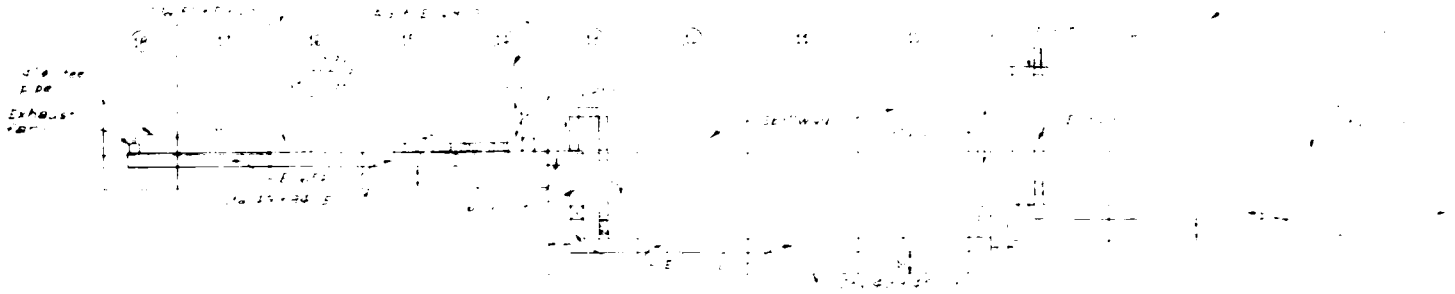
US Army Corps of Engineers

CONSTRUCTION FOUNDATION REPORT

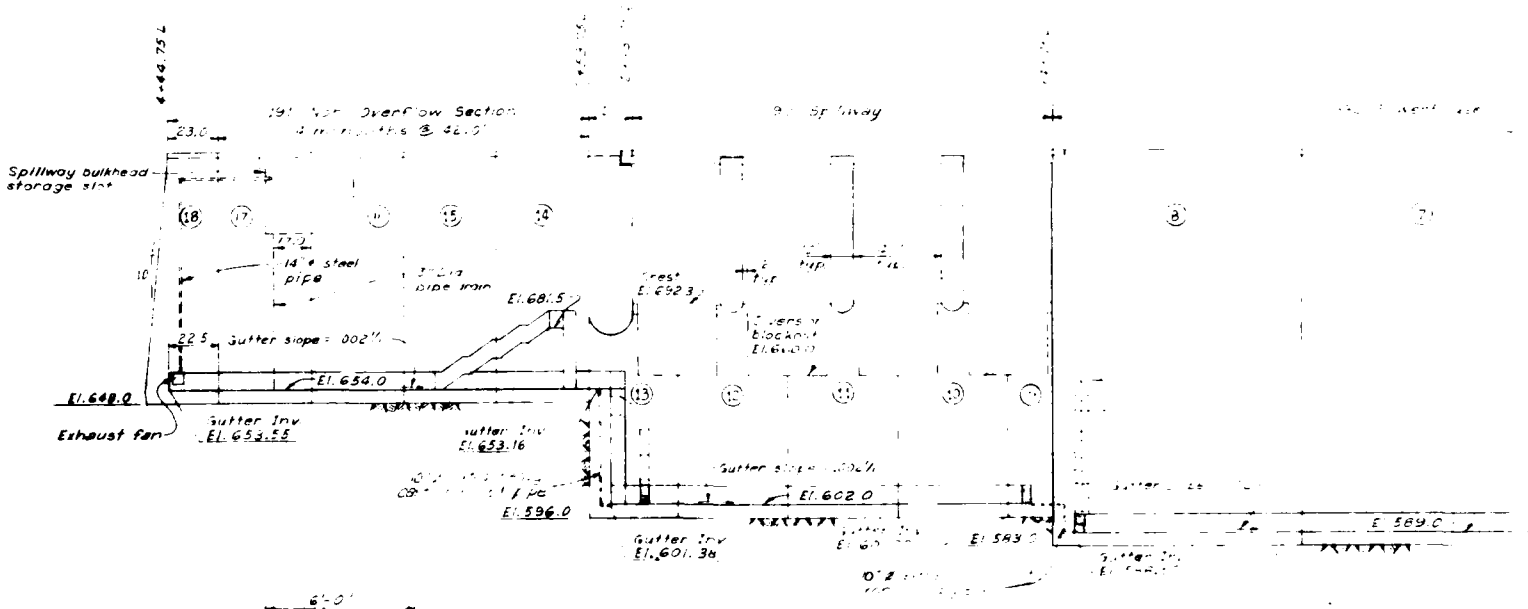
SPILLWAY - POWERHOUSE
GROUT CURTAIN AND
DRAPED FENCING DETAIL

Scale
Sheet number
Date MARCH 1985
Dwg No.
File No. 0-12-9256

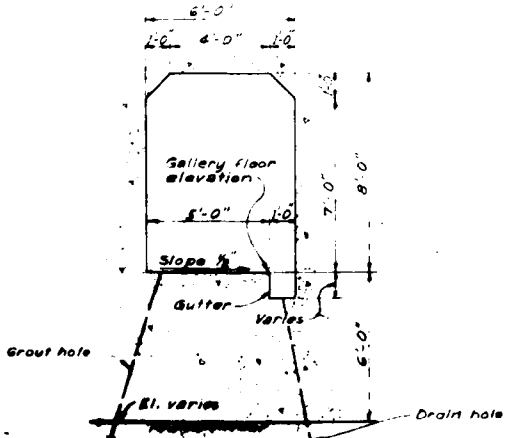
PLATE NO. 126



PLAN OF GALLERIES

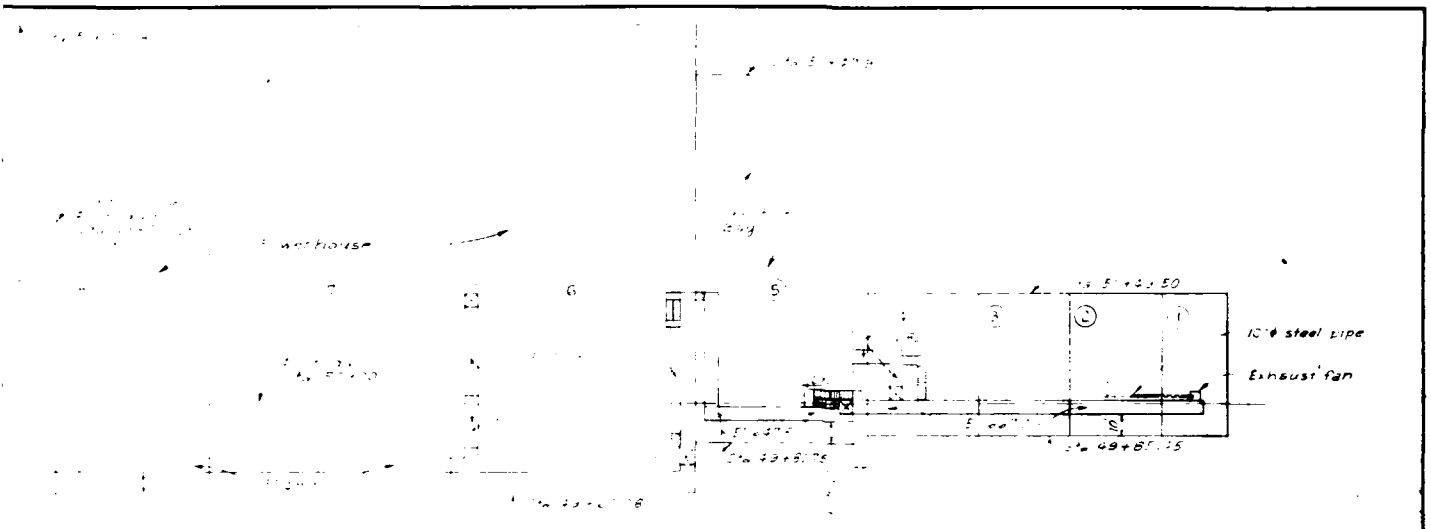


PROFILE OF GALLERIES

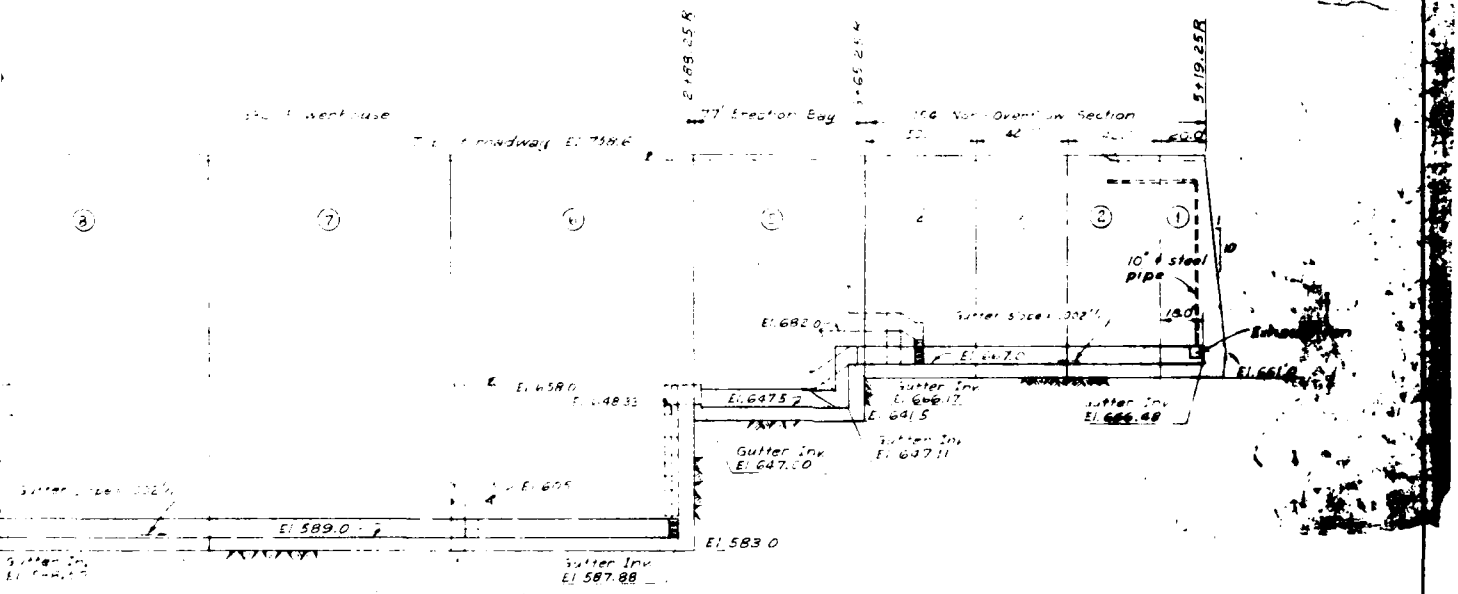


GROUTING & DRAINAGE GALLERY

DRAWIN
HAVE BEE
HALF TH



PLAN OF GALLERIES



PROFILE OF GALLERIES

Scale 30' = 0

DRAWINGS IN THIS FOLIO HAVE BEEN REDUCED TO ONE HALF THE ORIGINAL SCALE

Symbol	Revisions Descriptions	Date	Approved

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

US Army Corps of Engineers

MISSOURI RIVER, MISSOURI
HARRY S. TRUMAN DAM AND RESERVOIR
CONSTRUCTION FOUNDATION REPORT

GALLERIES
GENERAL LAYOUT

Designed by
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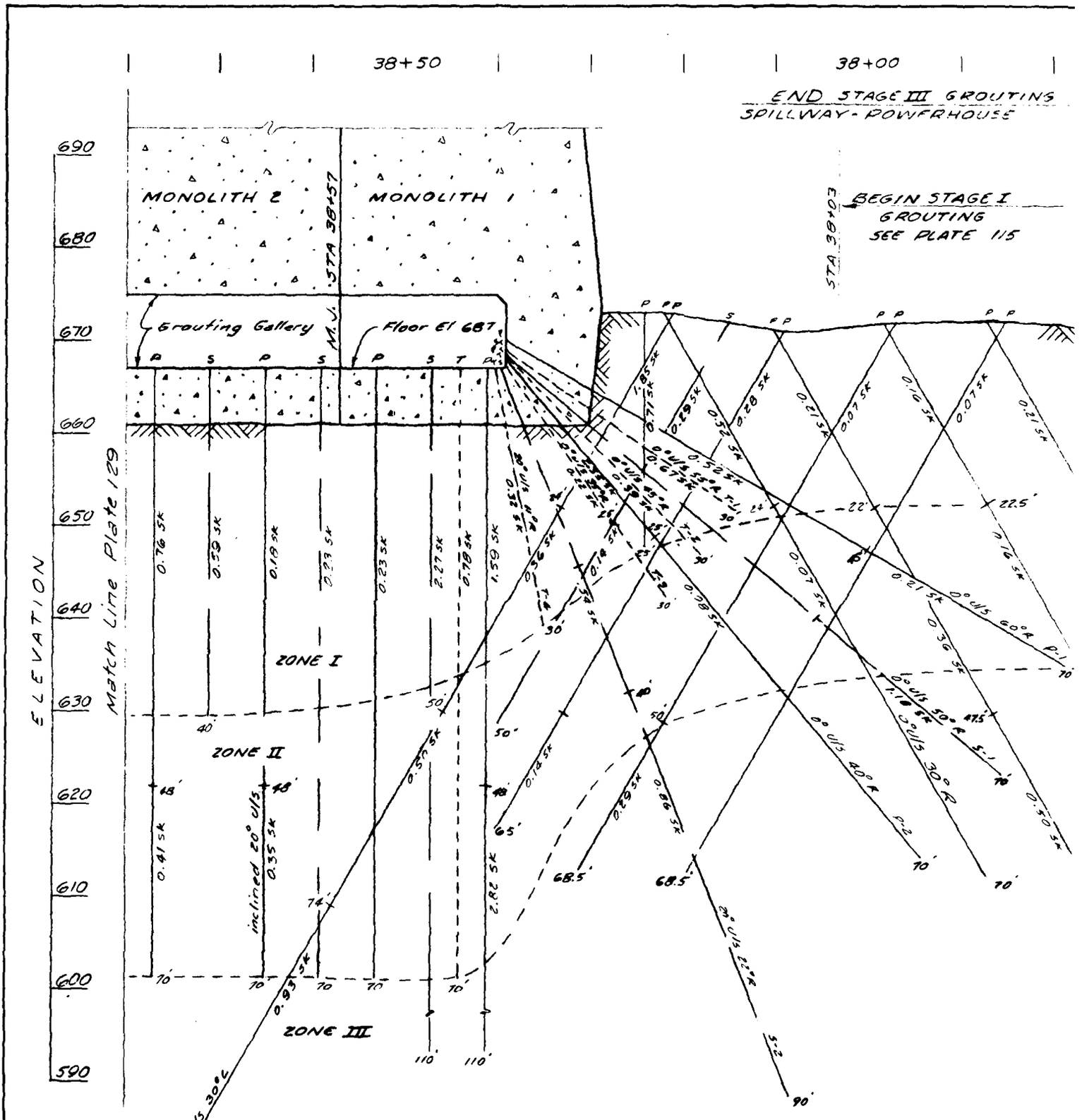
Checked by
Submitted by

Scale AS SHOWN
Date MARCH 1985
Sheet number
File No. 0-12-9257

PLATE NO. 127



SPILLWAY - POWERHOUSE GROUTING STAGE
MONOLITHS 1 AND 2

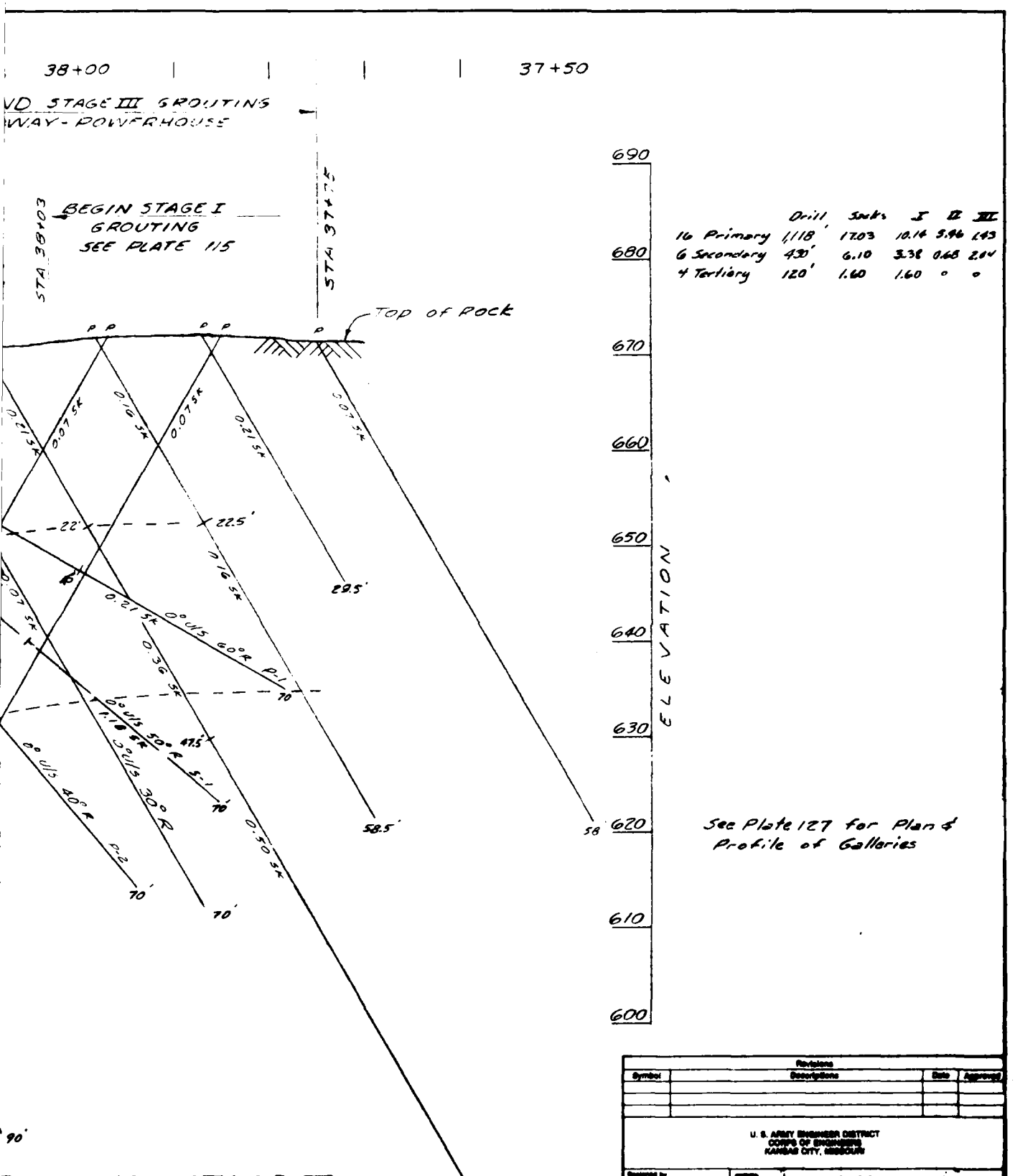
LOOKING DOWNSTREAM

STA 37+75 TO STA 38+80

Grout Line is 4.55' c

For Legend See

0 10
SCALE IN FEET



Revisions			
Symbol	Descriptions	Date	Approved

U. S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

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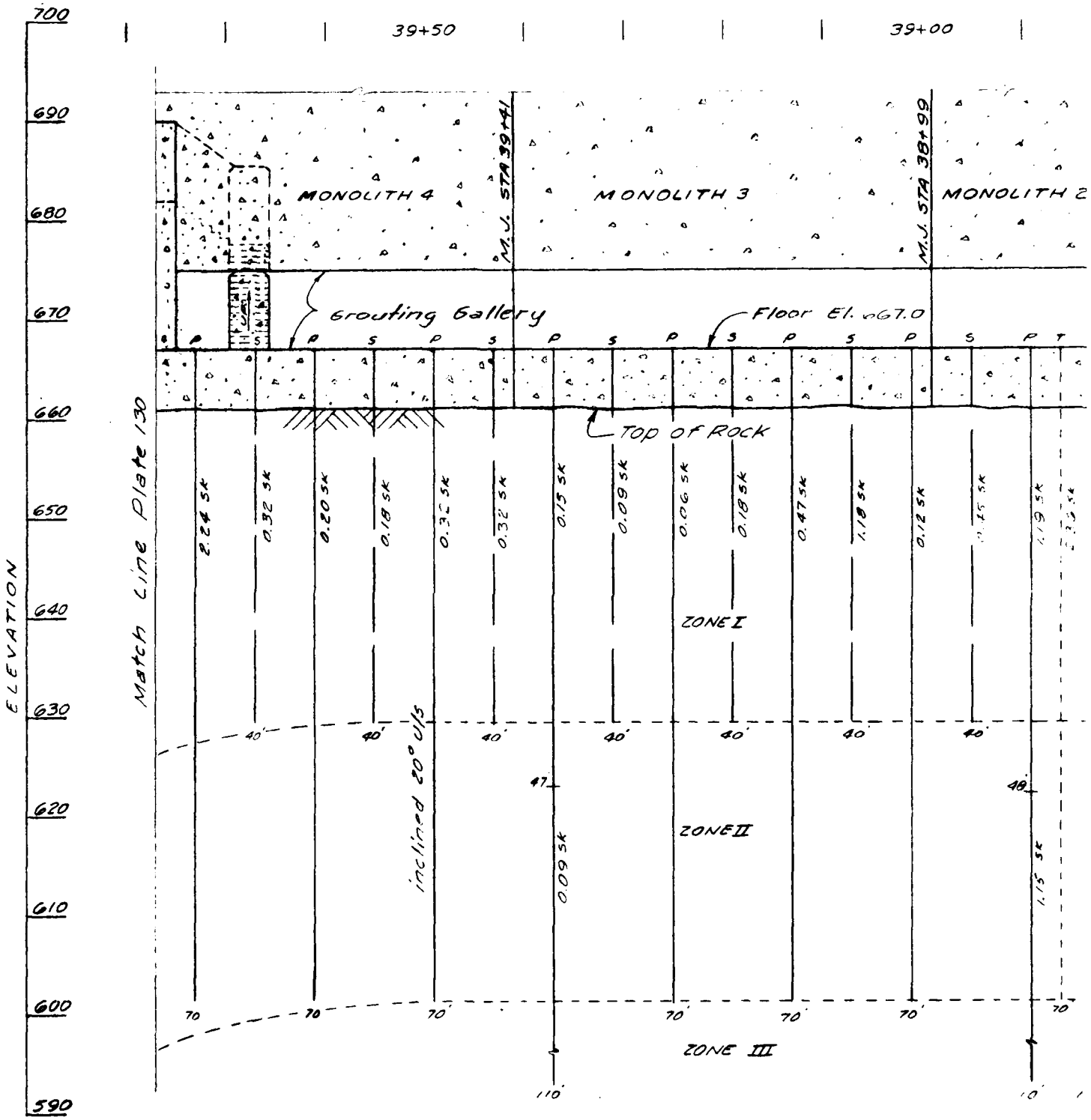
MISSOURI RIVER, NEBRASKA
HARRY S. TRUMAN DAM & RESERVOIR
CONSTRUCTION FOUNDATION REPORT

SPILLWAY-POWERHOUSE GROUTING MONOLITHS 1 and 2

Scale: AS SHOWN
Date: MARCH 1966
Sheet number:
File No. 0-12-

PLATE NO. 128



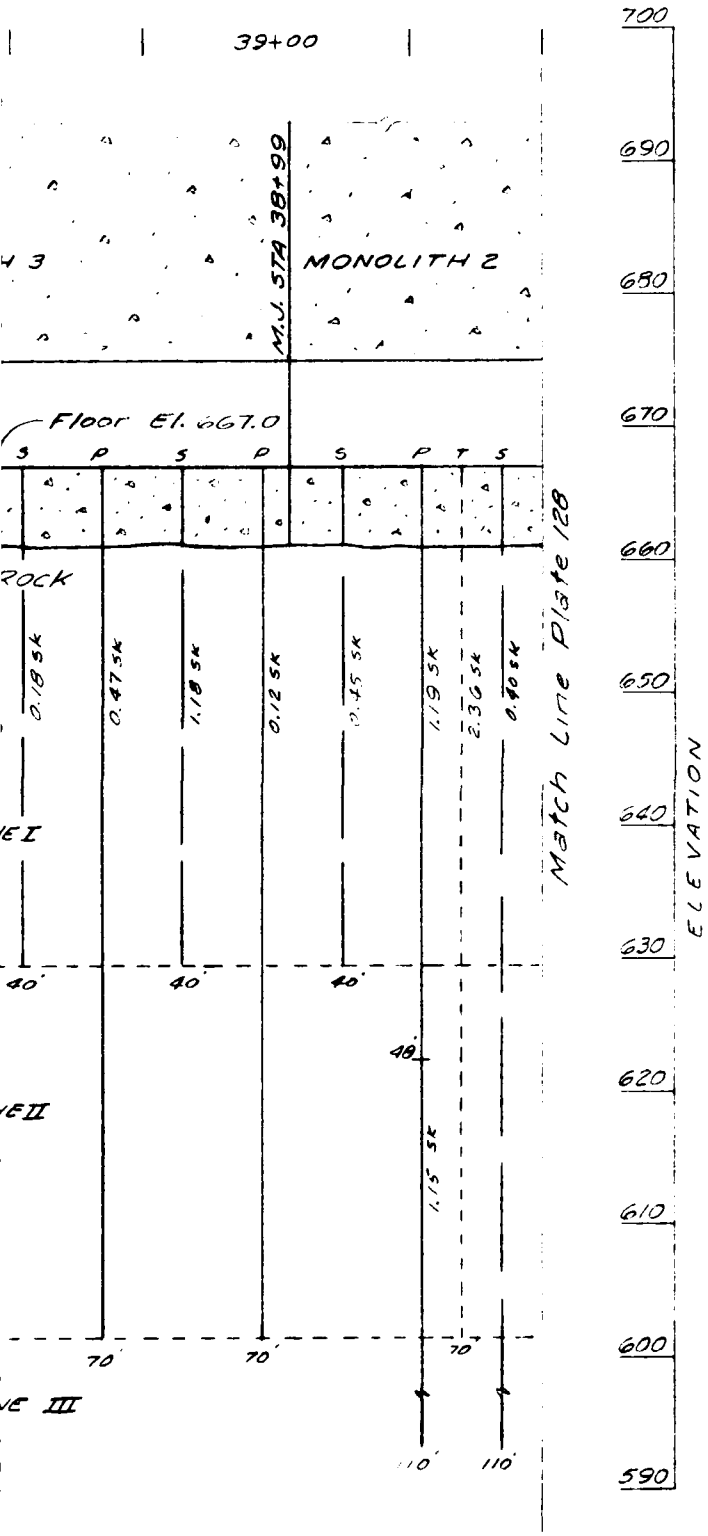
SPILLWAY-POWERHOUSE GROUTING STAGE III
MONOLITHS 2, 3, AND 4

LOOKING DOWNSTREAM

STA 38+80 TO STA 39+77

Grout Line

0 10
SCALE IN FEET



	Drill	Sacks	I	II	III
8 Primary	640'	5.99	4.75	1.24	0
8 Secondary	390'	3.12	3.12	0	0
1 Tertiary	70'	2.36	2.36	0	0

OUTING STAGE III

D 4

Grout Line is 4.55' u/s of Dam Axis

0 10
SCALE IN FEET

Revisions			
Symbol	Descriptions	Date	Approved

U. S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

OSAGE RIVER, MISSOURI
HARRY S. TRUMAN DAM & RESERVOIR
CONSTRUCTION FOUNDATION REPORT
SPILLWAY - POWERHOUSE
GROUTING
MONOLITHS 2,3, and 4

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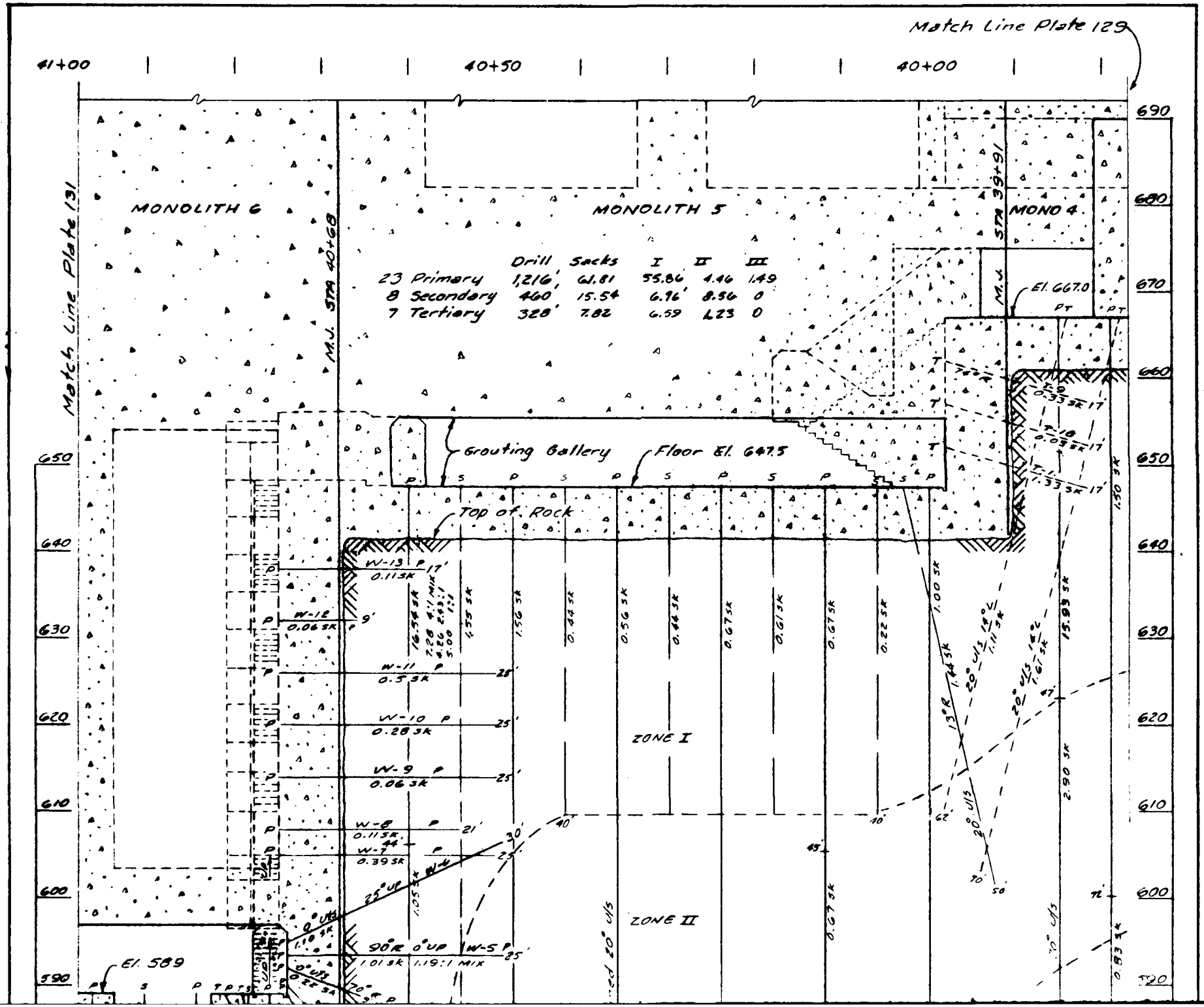
Submitted by:

Scale: AS SHOWN
Date: MARCH 1966
Dwg No.:
Sheet number:
FILE No. 0-18-9259

PLATE NO. 129


Match Line Plate 129
Match Line Plate 131
41+00
40+50
40+00
MONOLITH 6
MONOLITH 5
MONO 4
M.J. STA 40+68
STA 39+91
M.J.
El. 667.0
Drill Sacks I II III
23 Primary 1,216' 61.81 55.86 4.46 1.49
8 Secondary 460' 15.54 6.96' 8.56 0
7 Tertiary 328' 7.82 6.59 1.23 0
Grouting Gallery
Floor El. 647.5
Top of Rock
ZONE I
ZONE II
El. 589
690
680
670
660
650
640
630
620
610
600
590

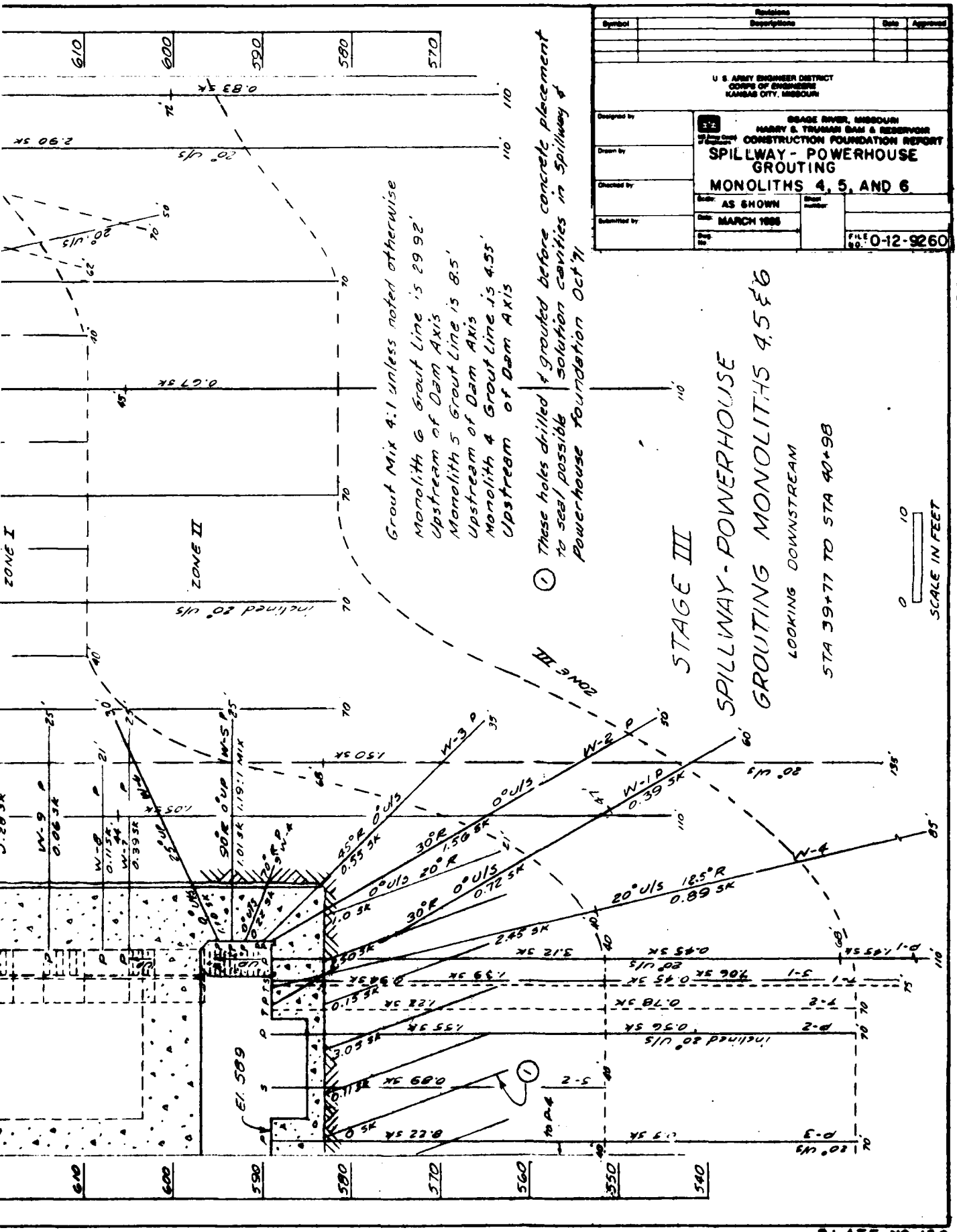
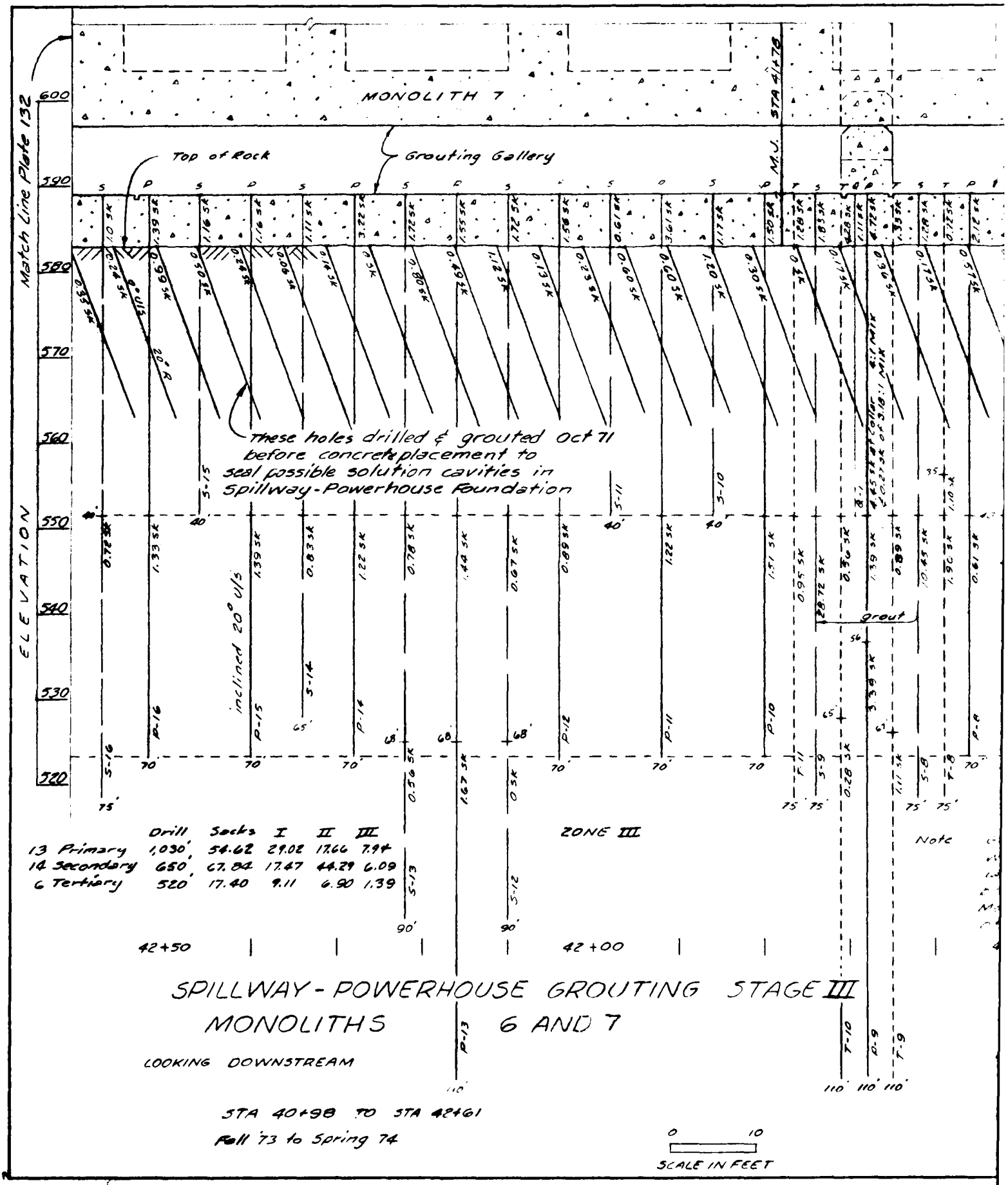
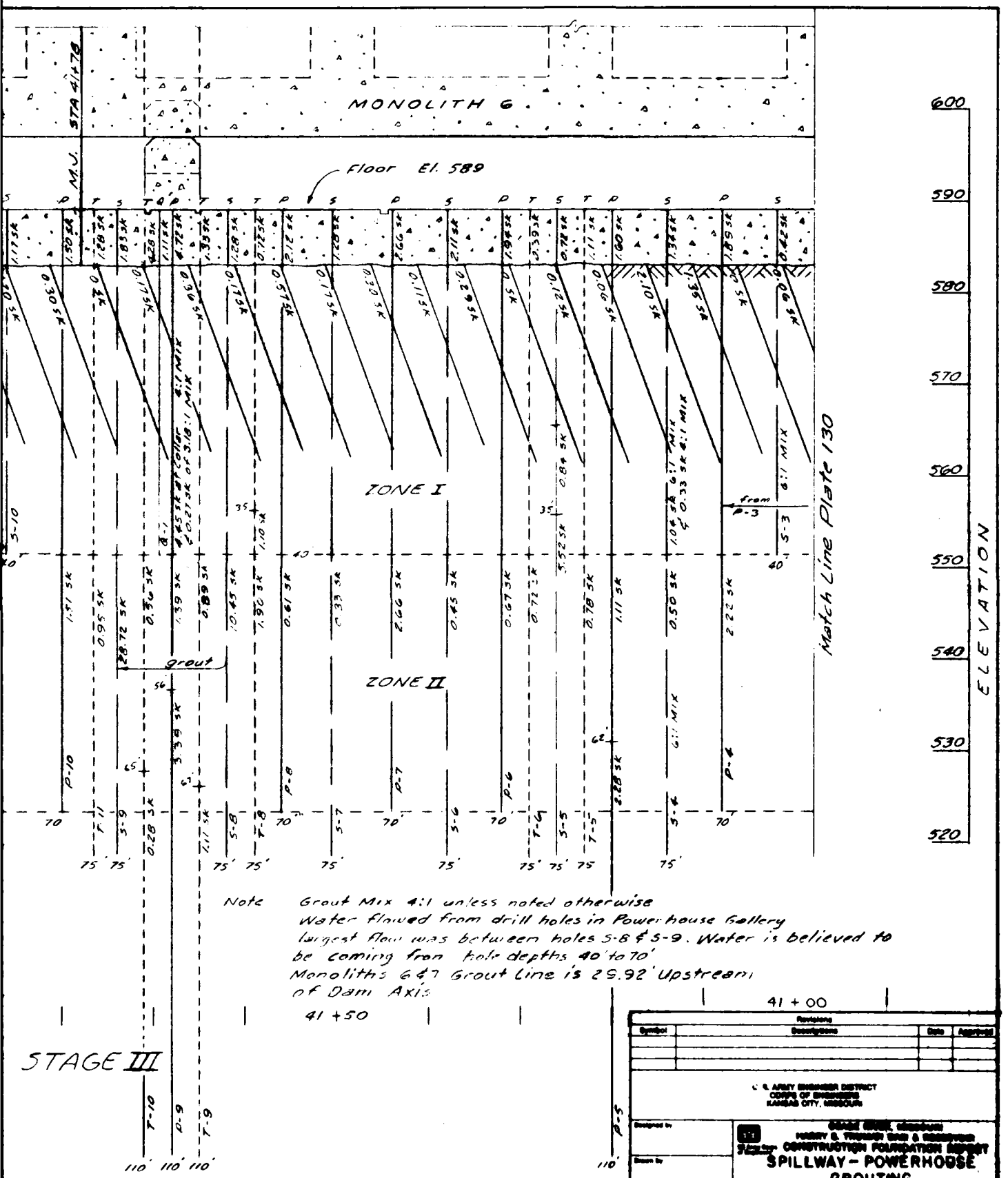

Revisions
Symbol
Descriptions
Date
Approved
U. S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI
Designed by
Drawn by
Checked by
Submitted by
OSAGE RIVER, MISSOURI
HARRY S. TRUMAN DAM & RESERVOIR
CONSTRUCTION FOUNDATION REPORT
SPILLWAY - POWERHOUSE
GROUTING
MONOLITHS 4, 5, AND 6
Scale AS SHOWN
Date MARCH 1966
Sheet number
Dwg. No.
FILE NO. 0-12-9260
Grout Mix 4:1 unless noted otherwise
Monolith 6 Grout Line is 29.92'
Upstream of Dam Axis
Monolith 5 Grout Line is 8.5'
Upstream of Dam Axis
Monolith 4 Grout Line is 4.55'
Upstream of Dam Axis
① These holes drilled & grouted before concrete placement to seal possible solution cavities in Spillway & Powerhouse foundation Oct '71
STAGE III
SPILLWAY - POWERHOUSE
GROUTING MONOLITHS 4,5 & 6
LOOKING DOWNSTREAM
STA 39+77 TO STA 40+98
SCALE IN FEET
ZONE I
ZONE II
ZONE III
El. 589
610
600
590
580
570
560
550
540

PLATE NO. 130


MONOLITH 7
Top of Rock
Grouting Gallery
Match Line Plate 132
ELEVATION
These holes drilled & grouted Oct 71 before concrete placement to seal possible solution cavities in Spillway-Powerhouse Foundation
inclined 20° U/S
grout
Drill Socks I II III
13 Primary 1,030' 54.62 29.02 17.66 7.94
14 Secondary 650' 67.84 17.47 44.29 6.09
6 Tertiary 520' 17.40 9.11 6.90 1.39
ZONE III
Note
42+50
42+00
SPILLWAY - POWERHOUSE GROUTING STAGE III
MONOLITHS 6 AND 7
LOOKING DOWNSTREAM
STA 40+98 TO STA 42+61
Fall '73 to Spring 74
SCALE IN FEET



Note Grout Mix 4:1 unless noted otherwise
Water flowed from drill holes in Powerhouse Gallery
largest flow was between holes S-8 & S-9. Water is believed to be coming from hole depths 40' to 70'
Monoliths 6 & 7 Grout Line is 29.92' Upstream of Dam Axis

Symbol	Descriptions	Date	Approved

U. S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

KANSAS CITY, MISSOURI
HARRY S. TRUMAN DAM & RESERVOIR
CONSTRUCTION FOUNDATION REPORT

SPILLWAY – POWERHOUSE
GROUTING
MONOLITHS 6 AND 7

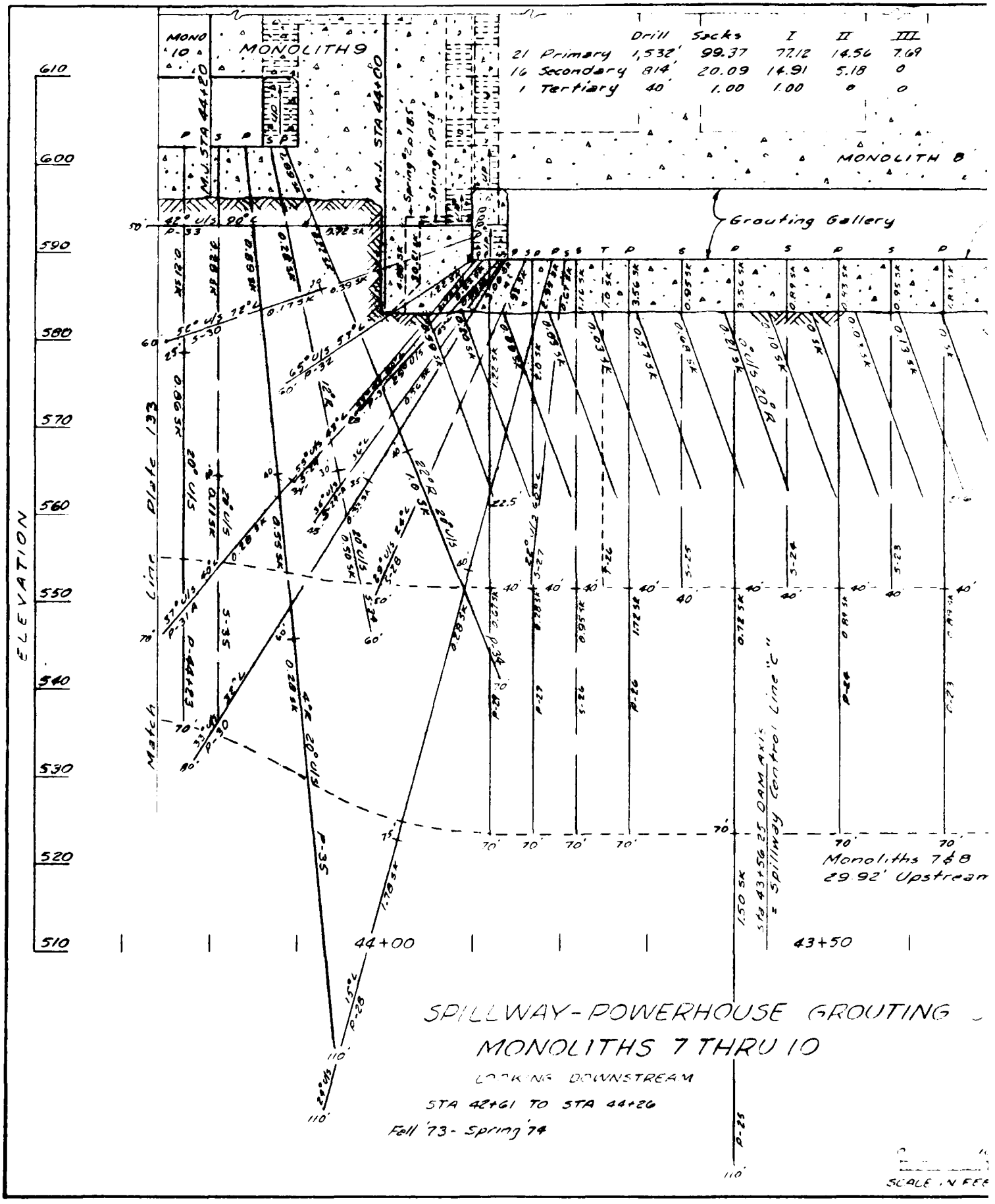
Scale AS SHOWN
Date MARCH 1955

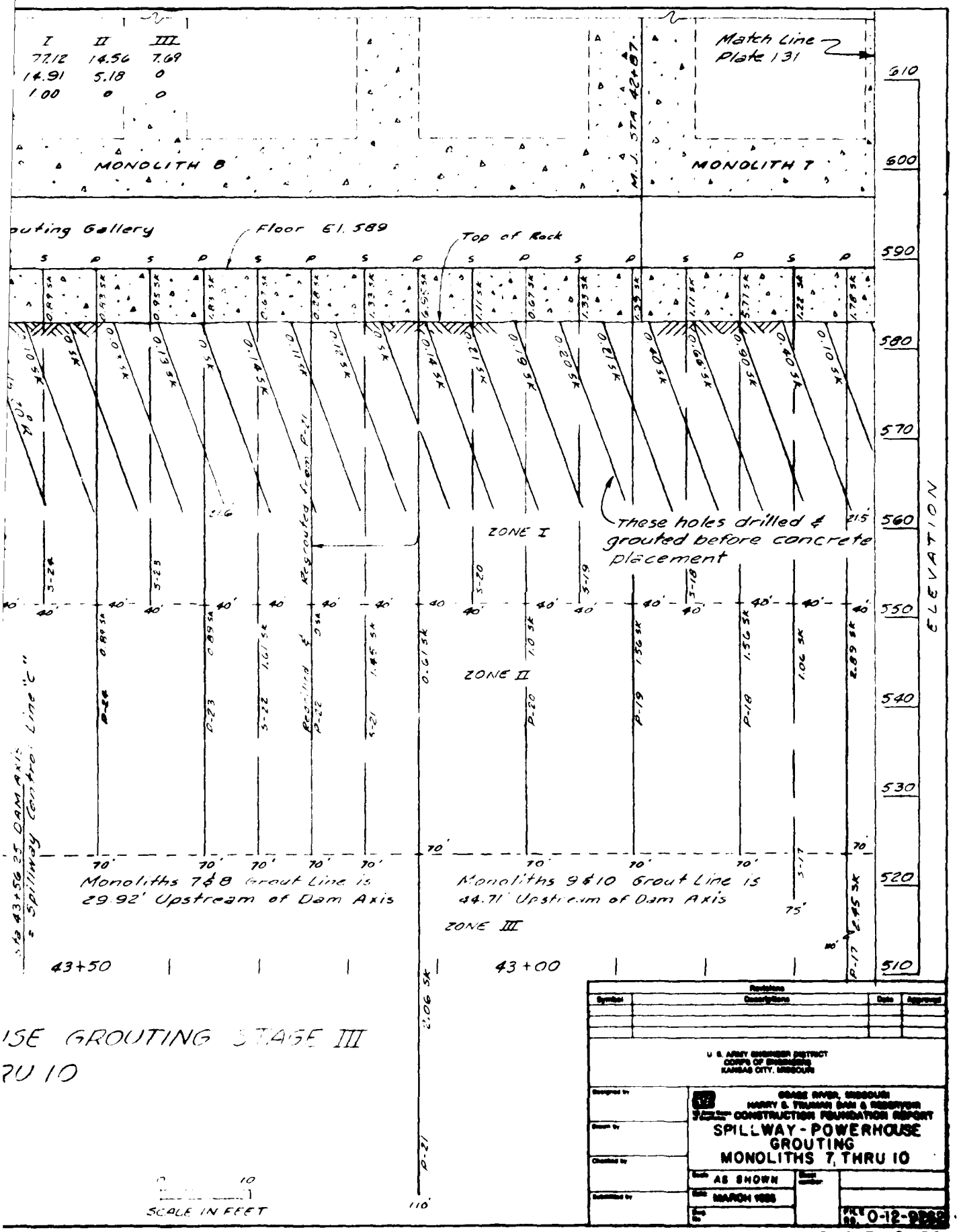
Designed by
Drawn by
Checked by
Submitted by

W-0-12-8831

PLATE NO. 131

10
IN FEET


Drill Sacks I II III
21 Primary 1,532' 99.37 77.12 14.56 7.69
16 Secondary 814' 20.09 14.91 5.18 0
1 Tertiary 40' 1.00 1.00 0 0
MONO 10
MONOLITH 9
MONOLITH 8
Grouting Gallery
M.J. STA 44+20
M.J. STA 44+00
Match Line Plate 133
ELEVATION
610
600
590
580
570
560
550
540
530
520
510
44+00
43+50
Monoliths 7 & 8
29.92' Upstream
Sta 43+56.25 DAM AXIS
= Spillway Control Line "C"
SPILLWAY-POWERHOUSE GROUTING
MONOLITHS 7 THRU 10
LOOKING DOWNSTREAM
STA 42+61 TO STA 44+26
Fall '73 - Spring '74
SCALE IN FEET



ISE GROUTING STAGE III
7U 10

Revisions			
Symbol	Descriptions	Date	Approved

U. S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

GRAND RIVER, MISSOURI
HARRY S. TRUMAN DAM & RESERVOIR
CONSTRUCTION FOUNDATION REPORT

SPILLWAY - POWERHOUSE
GROUTING
MONOLITHS 7, THRU 10

Designed by
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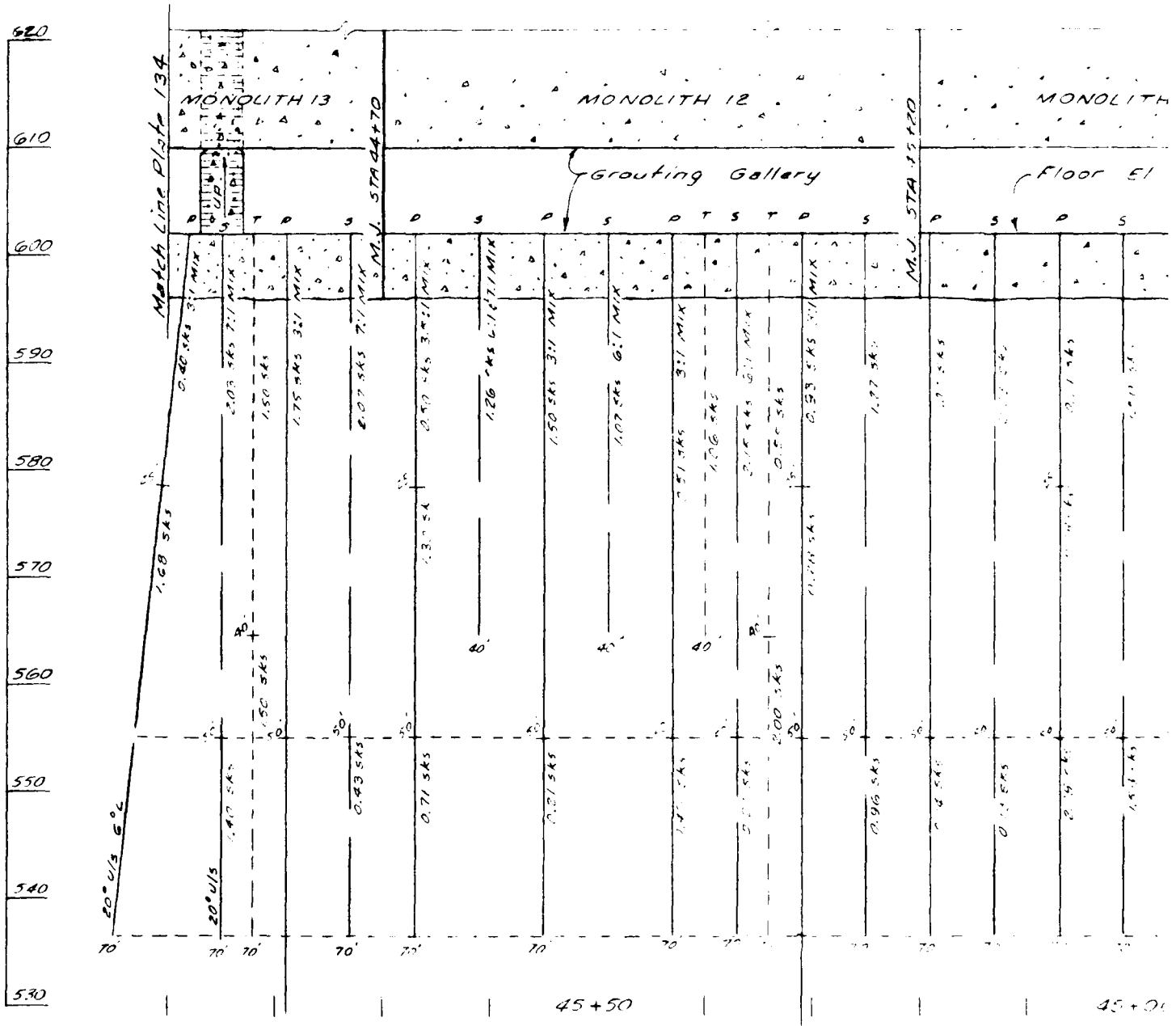
Submitted by

Scale: AS SHOWN
Date: MARCH 1966
Sheet number
File No. 0-12-9999

PLATE NO. 132



	Drill	Sacks	I	II	III
14 Primary	1,100'	30.53	16.41	12.06	2.06
14 Secondary	800'	23.07	17.40	5.67	0
5 Tertiary	280'	9.67	6.17	3.50	0

SPILLWAY-POWERHOUSE GROUTING STAGE
MONOLITHS 10 THRU 13

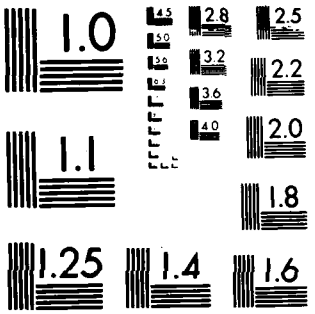
LOOKING DOWNSTREAM

STA 44+26 TO STA 45+90

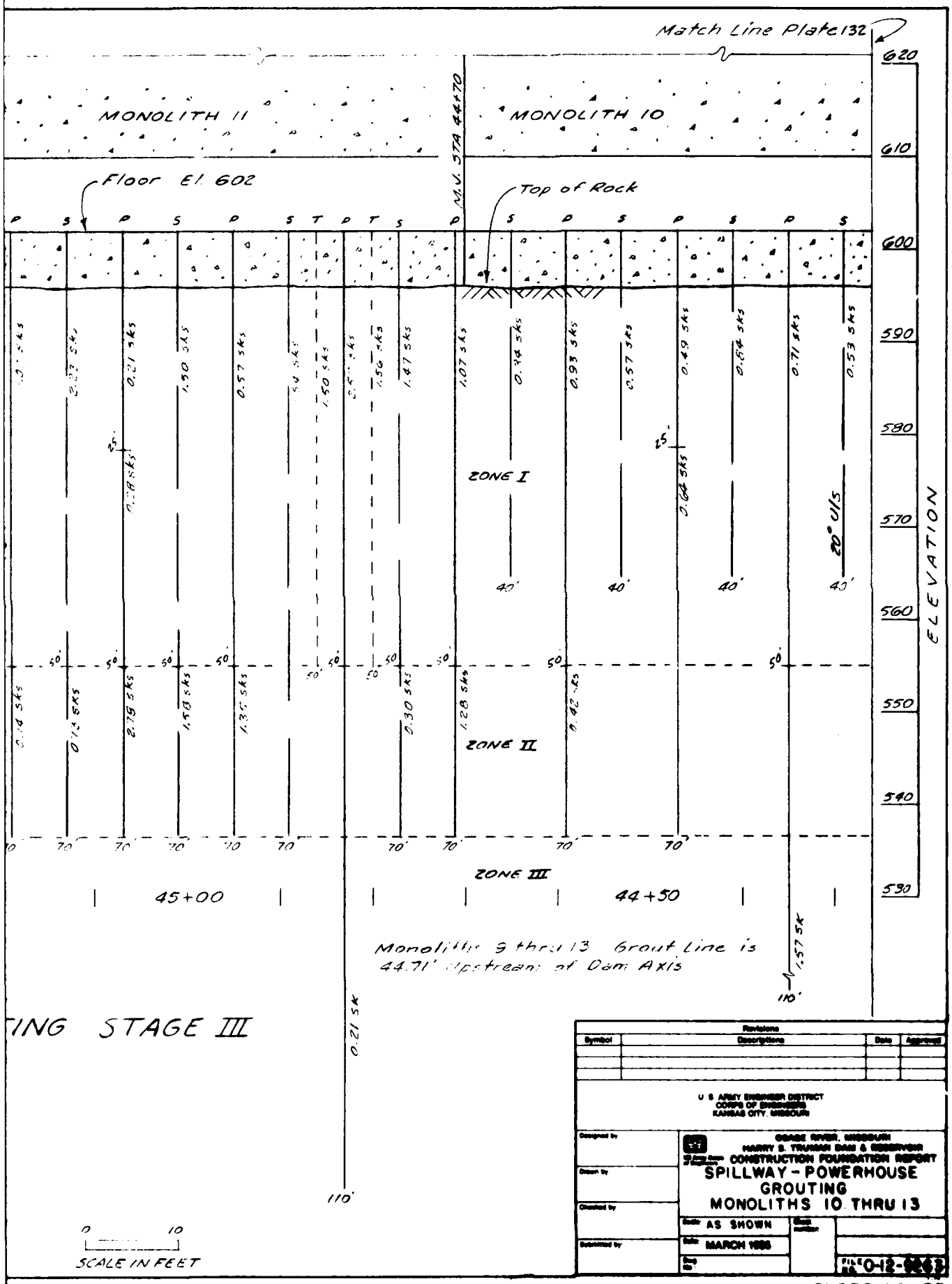
AD-A154 456 OSAGE RIVER BASIN OSAGE RIVER MISSOURI HARRY S TRUMAN DAM & RESERVOIR MU..(U) CORPS OF ENGINEERS KANSAS CITY MO KANSAS CITY DISTRICT R F GRIFFITH ET AL. 1984 4/4

UNCLASSIFIED F/G 13/13 NL

END
DATE
FILMED
7-85
DTIC



MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS 1963



Revisions			
Symbol	Descriptions	Date	Approved

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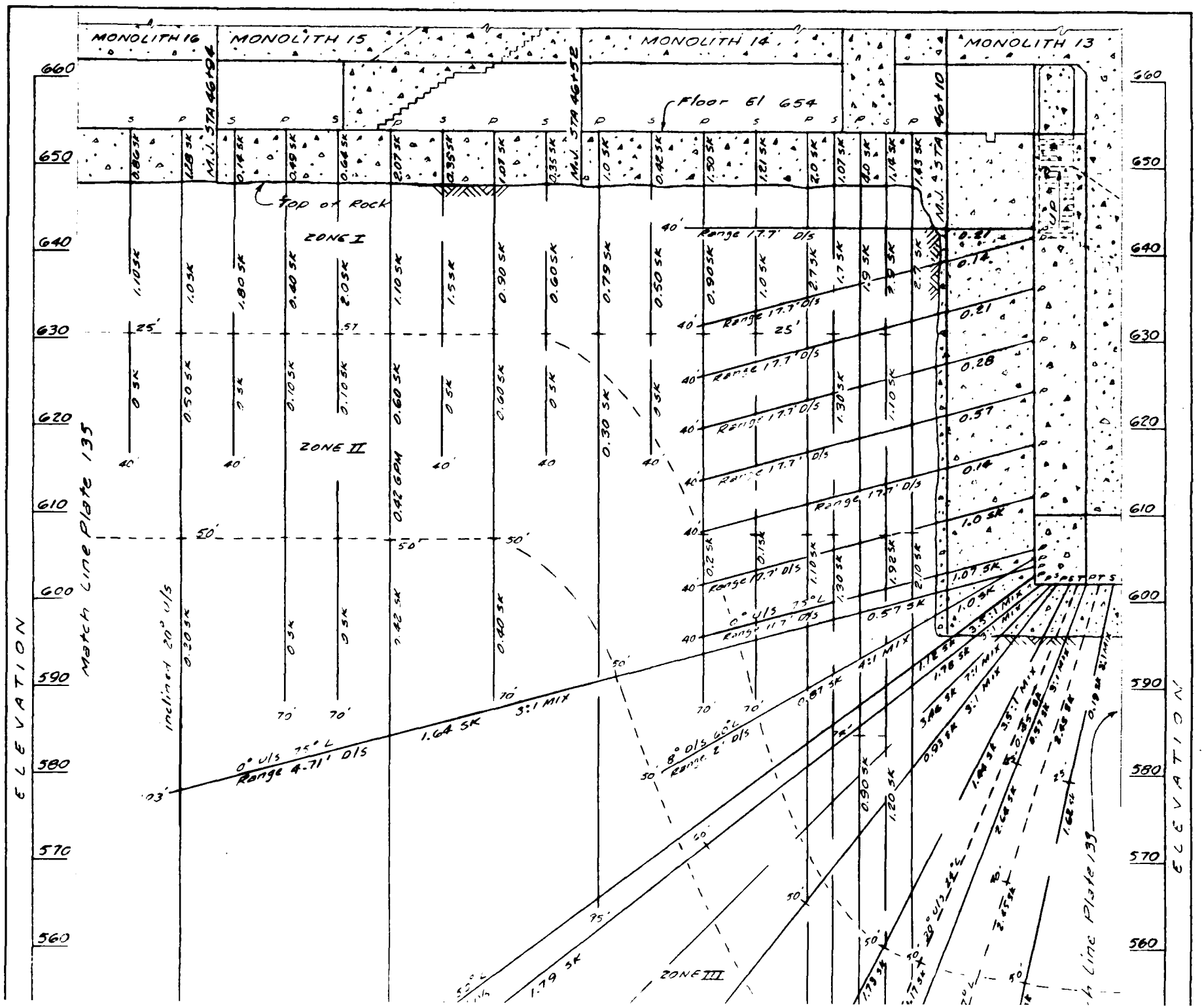
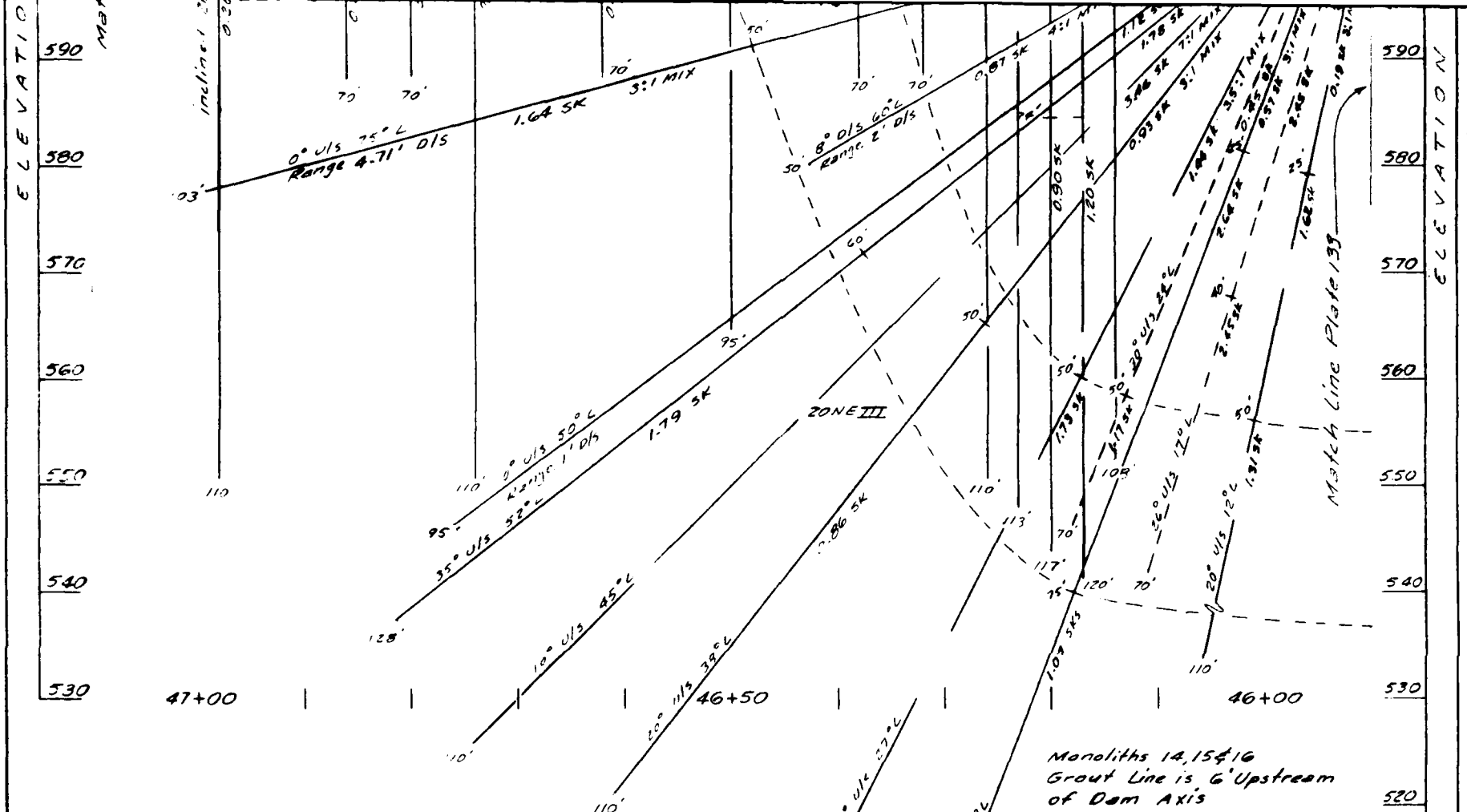
CONSTRUCTION FOUNDATION REPORT
SPILLWAY - POWERHOUSE
GROUTING
MONOLITHS 10 THRU 13

Scale: AS SHOWN
Date: MARCH 1966
Dwg No.
FILE No. 0-12-9263

PLATE NO. 133


MONOLITH 16
MONOLITH 15
MONOLITH 14
MONOLITH 13
M.J. STA 46+94
M.J. STA 46+52
M.J. STA 46+10
Floor El 654
Top of Rock
ZONE I
ZONE II
ZONE III
Range 17.7' D/S
Range 4.71' D/S
0.42 GPM
3:1 MIX
4:1 MIX
3.5:1 MIX
7:1 MIX
Match Line Plate 135
ELEVATION
660
650
640
630
620
610
600
590
580
570
560



Monoliths 14, 15 & 16
Grout Line is 6' Upstream of Dam Axis

Monoliths 9 thru 13
Grout Line is 44.71' Upstream of Dam Axis

	Drill	Sacks	I	II	III
23 Primary	1,688'	53.25	43.61	3.22	6.42
12 Secondary	903'	34.99	31.85	3.14	0
2 Tertiarty	140'	6.52	2.90	3.62	0

Grout Holes Not Shown 3:1 Mix
Sta 46+00

Range 7.71' D/S	0.86 SK
12.71' D/S	1.07 SK
17.71' D/S	0.71 SK
23.71' D/S	0 SK

SPILLWAY-POWERHOUSE GROUTING STAGE III
MONOLITHS 13 THRU 16

LOOKING DOWNSTREAM

STA 45+90 TO STA 47+10

0 10
SCALE IN FEET

U. S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

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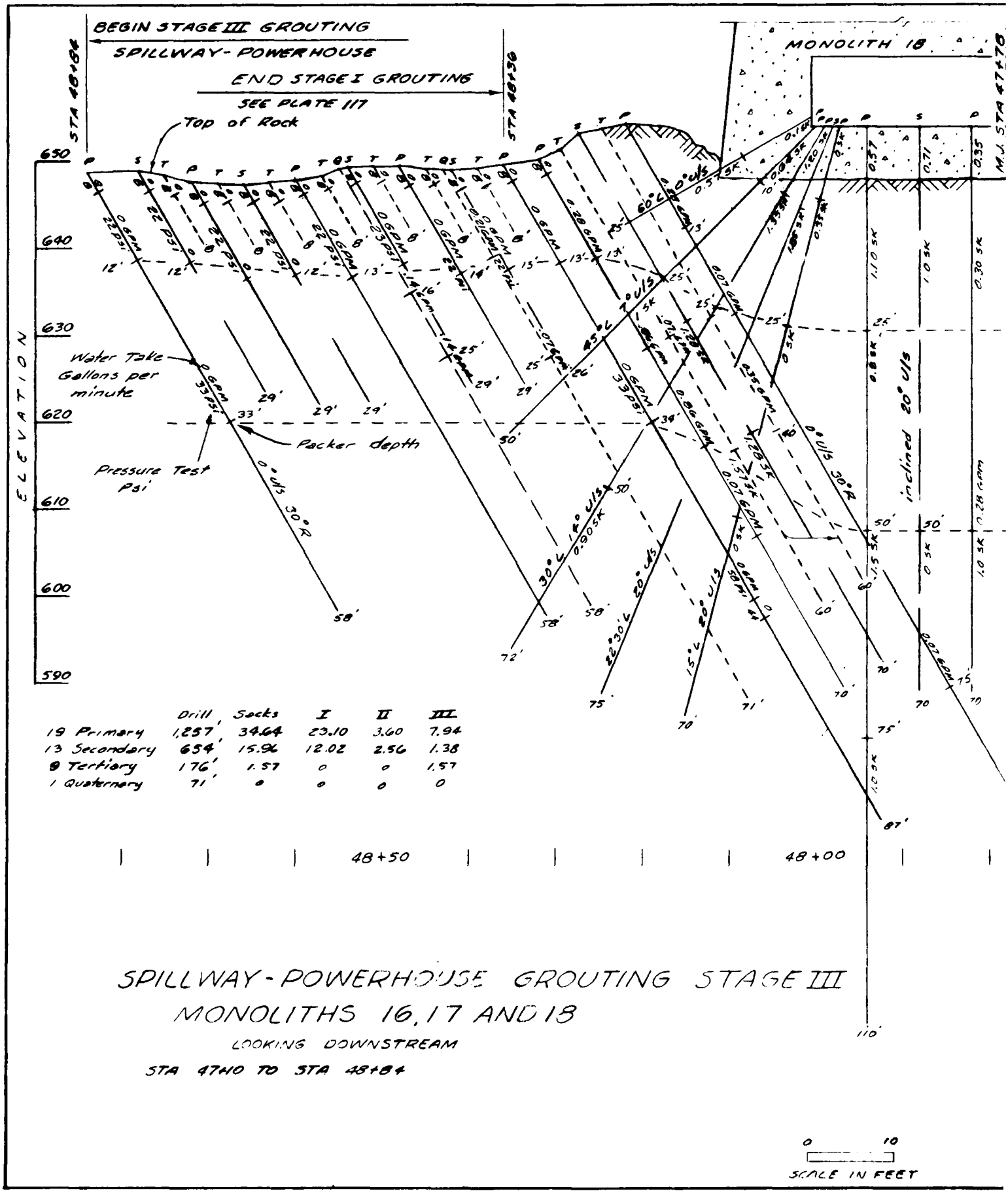
HARRY S. TRUMAN DAM & RESERVOIR
STATUS: CONSTRUCTION FOUNDATION REPORT

SPILLWAY - POWERHOUSE
GROUTING
MONOLITHS 13 THRU 16

Scale: AS SHOWN
Date: MARCH 1968
File No. 0-12-9604

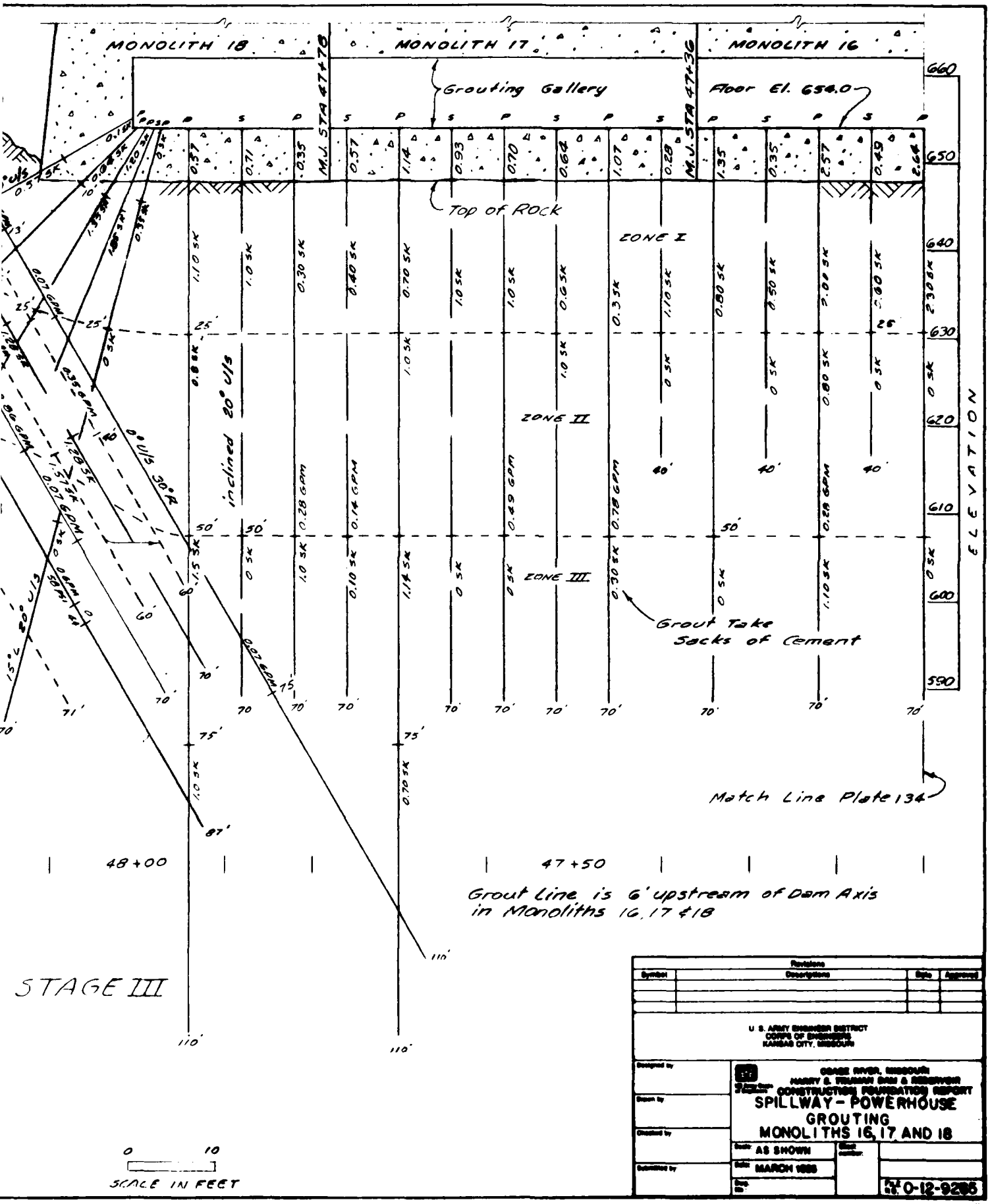
PLATE NO. 134



	Drill	Sacks	I	II	III
19 Primary	1,257'	34.64	23.10	3.60	7.94
13 Secondary	654'	15.96	12.02	2.56	1.38
8 Tertiary	176'	1.57	0	0	1.57
1 Quaternary	71'	0	0	0	0

SPILLWAY-POWERHOUSE GROUTING STAGE III
MONOLITHS 16, 17 AND 18
LOOKING DOWNSTREAM
STA 47+10 TO STA 48+84

0 10
SCALE IN FEET


MONOLITH 18
MONOLITH 17
MONOLITH 16
M.J. STA 47+70
M.J. STA 47+36
Grouting Gallery
Floor El. 654.0
Top of Rock
ZONE I
ZONE II
ZONE III
inclined 20° U/S
0° U/S 30° R
Grout Take
Sacks of Cement
Match Line Plate 134
ELEVATION
660
650
640
630
620
610
600
590
48+00
47+50
Grout Line is 6' upstream of Dam Axis
in Monoliths 16, 17 & 18
STAGE III
0 10
SCALE IN FEET
Revisions
Symbol
Descriptions
Date
Approved
U. S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI
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HARRY S. TRUMAN DAM & RESERVOIR
CONSTRUCTION FOUNDATION REPORT
SPILLWAY - POWERHOUSE
GROUTING
MONOLITHS 16, 17 AND 18
Scale AS SHOWN
Date MARCH 1966
File No. 0-12-9285

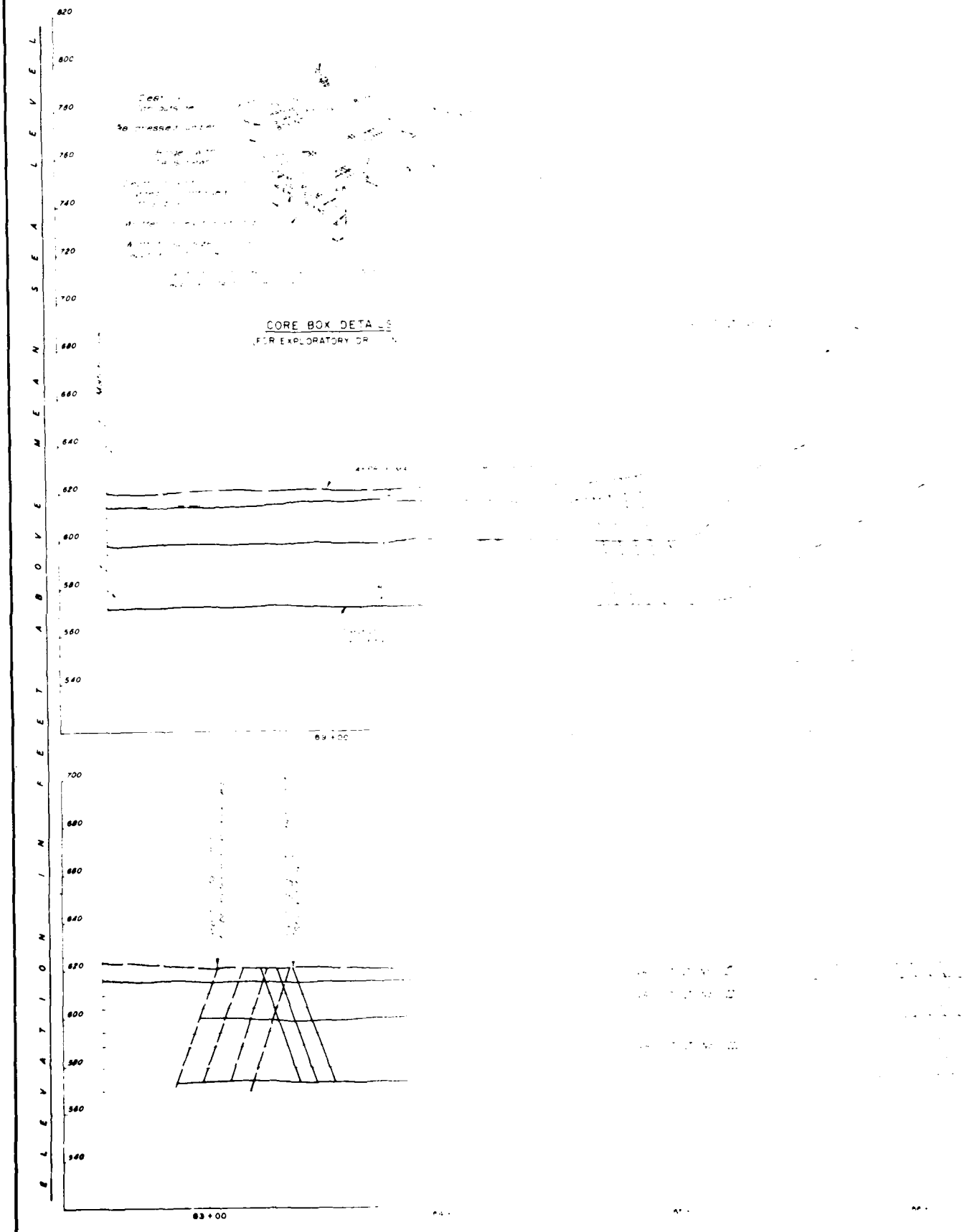
PLATE NO. 135

STAGE VI CONSTRUCTION

TRUCTION

(2)

STAGE VI CONSTRUCTION


ELEVATION IN FEET ABOVE MEAN SEA LEVEL
820
800
780
760
740
720
700
680
660
640
620
600
580
560
540
CORE BOX DETAILS
FOR EXPLORATORY DR
89+00
700
680
660
640
620
600
580
560
540
83+00

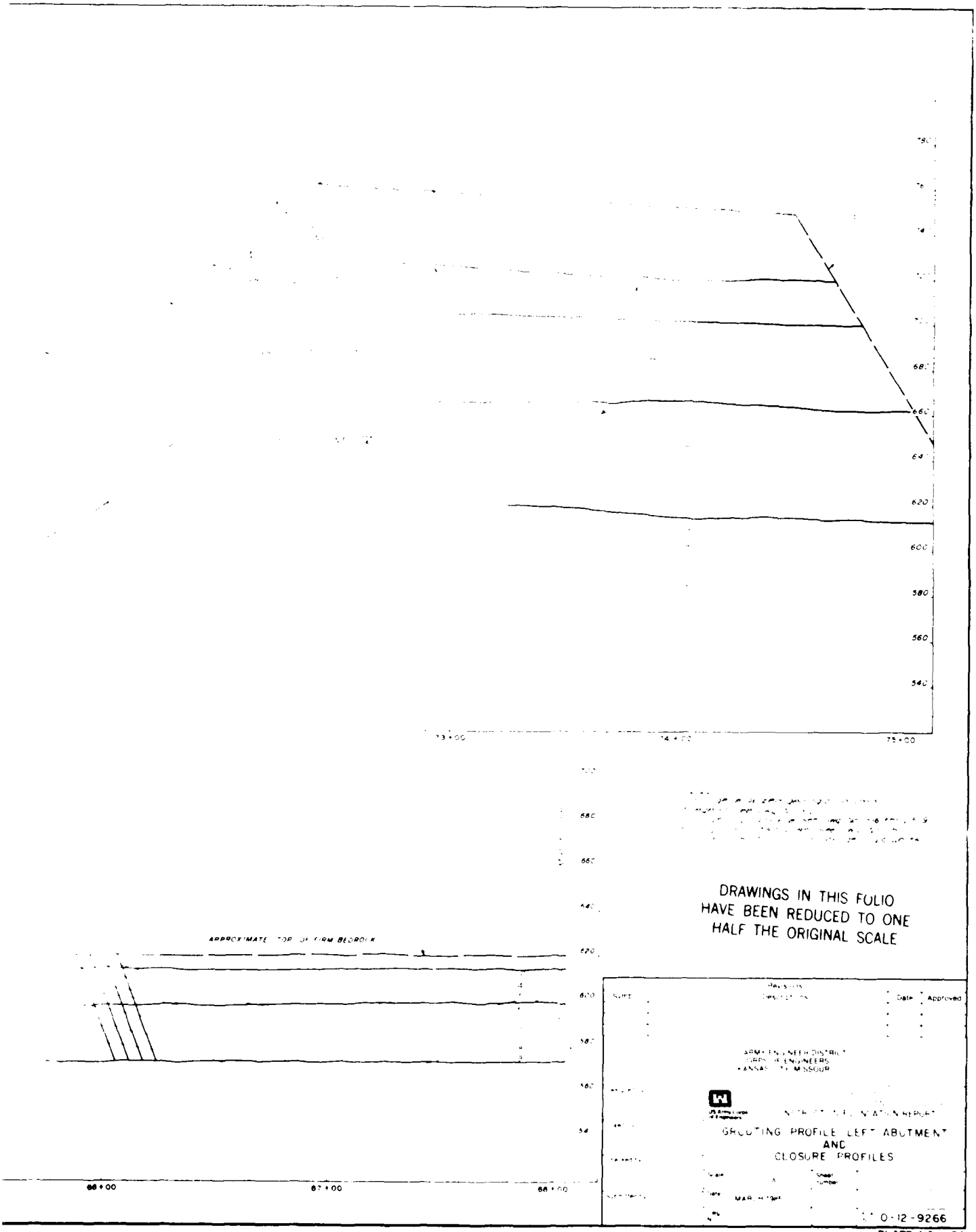
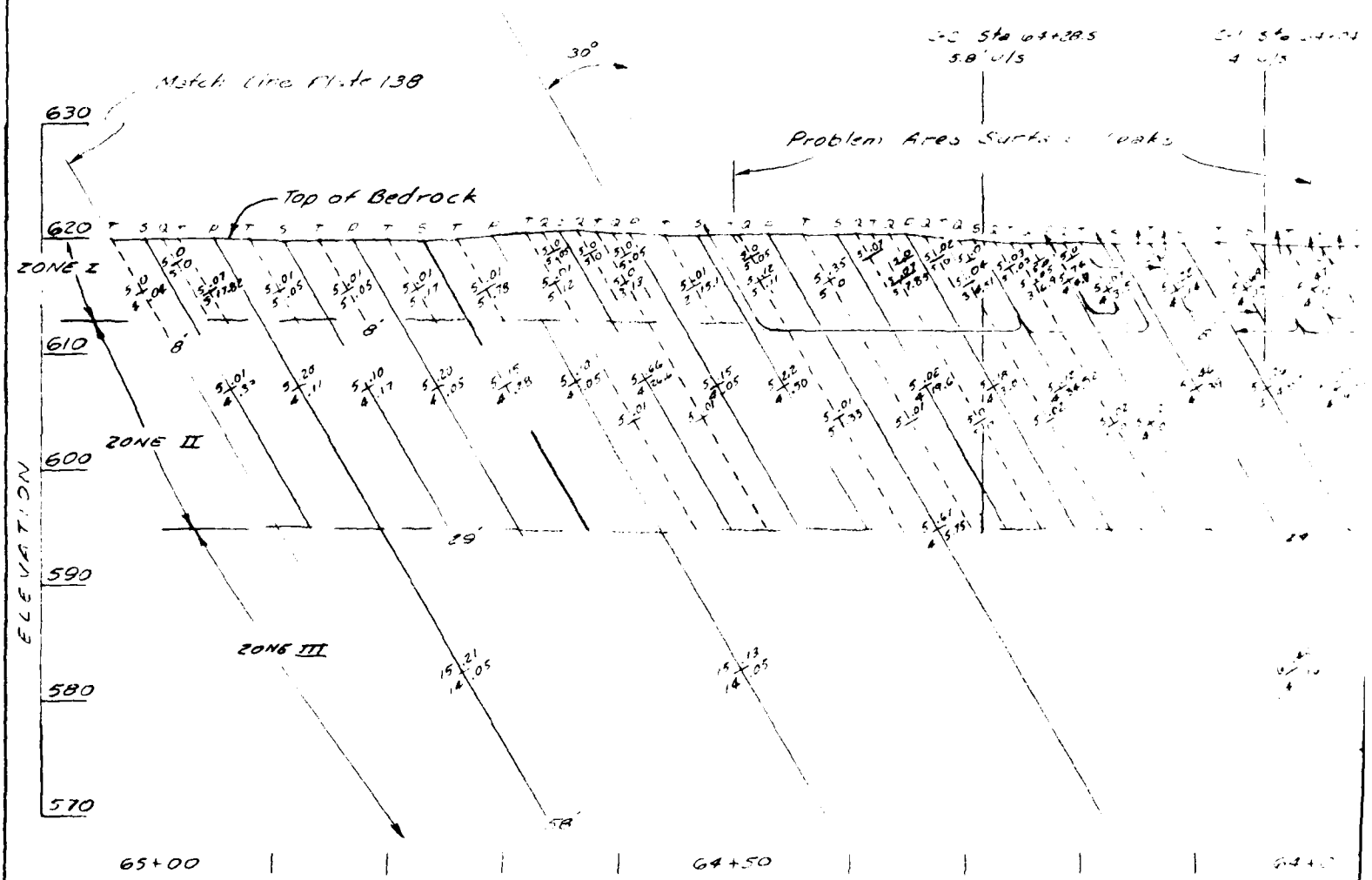

680
660
640
620
600
580
560
540
73+00
74+00
75+00
APPROXIMATE TOP OF FIRM BEDROCK
680
660
640
620
600
580
560
540
66+00
67+00
68+00
DRAWINGS IN THIS FOLIO
HAVE BEEN REDUCED TO ONE
HALF THE ORIGINAL SCALE
Date
Approved
GROUTING PROFILE LEFT ABUTMENT
AND
CLOSURE PROFILES
0-12-9266

PLATE NO 136



Pressure Test C-1
at 8' 5 Psi 0.06 CFM in 10 Min
at top 5 Psi 0.04 CFM in 10 Min

Pressure Test C-2
at 22' 16 Psi 0.01 CFM in 10 Min
at 12' 10 Psi 0.11 CFM in 10 Min
at 8' 6 Psi 0 CFM in 10 Min
at top 5 Psi 0.20 CFM in 10 Min
Grouting
at 8' 5 Psi 0.27 sks in 30 Min
at top 4 Psi 6.12 sks in 30 Min
Grout emitted at sta 64+28 & 4' U/S

While grouting 63+63 grout emitted at sta 63+69 & to 3' U/S
During Pres Test at 63+75 at top & 8' water leak in 63+85 & 63+95 while grouting at the surface leak between 63+70 to 63+80
While grouting 63+78 non surface leaks at this hole & at 63+85 &
While grouting 63+95 grout emitted [illegible] leaks while [illegible] 63+81 at [illegible] hole 63+85 line 2 [illegible] water leaks while grouting 63+90 surface leaks [illegible] hole & hole at 63+84 [illegible]

While grouting 64+33 [illegible] While grouting 64+33 leak at 63+90 & & 64+30 [illegible] While [illegible] 64+05 leak [illegible] to [illegible] While grout [illegible] 64+[illegible] surface [illegible] While grouting 64+4[illegible] to [illegible] 64+05 & [illegible] grouting 64+00 leaks [illegible] 64+33 is U/S [illegible] leaks [illegible] grouting 64+05 [illegible] line 2 & [illegible] 64+[illegible] [illegible] many [illegible]

STAGE VI GROUTING LINE [illegible] TA 63+39 TO STA [illegible]

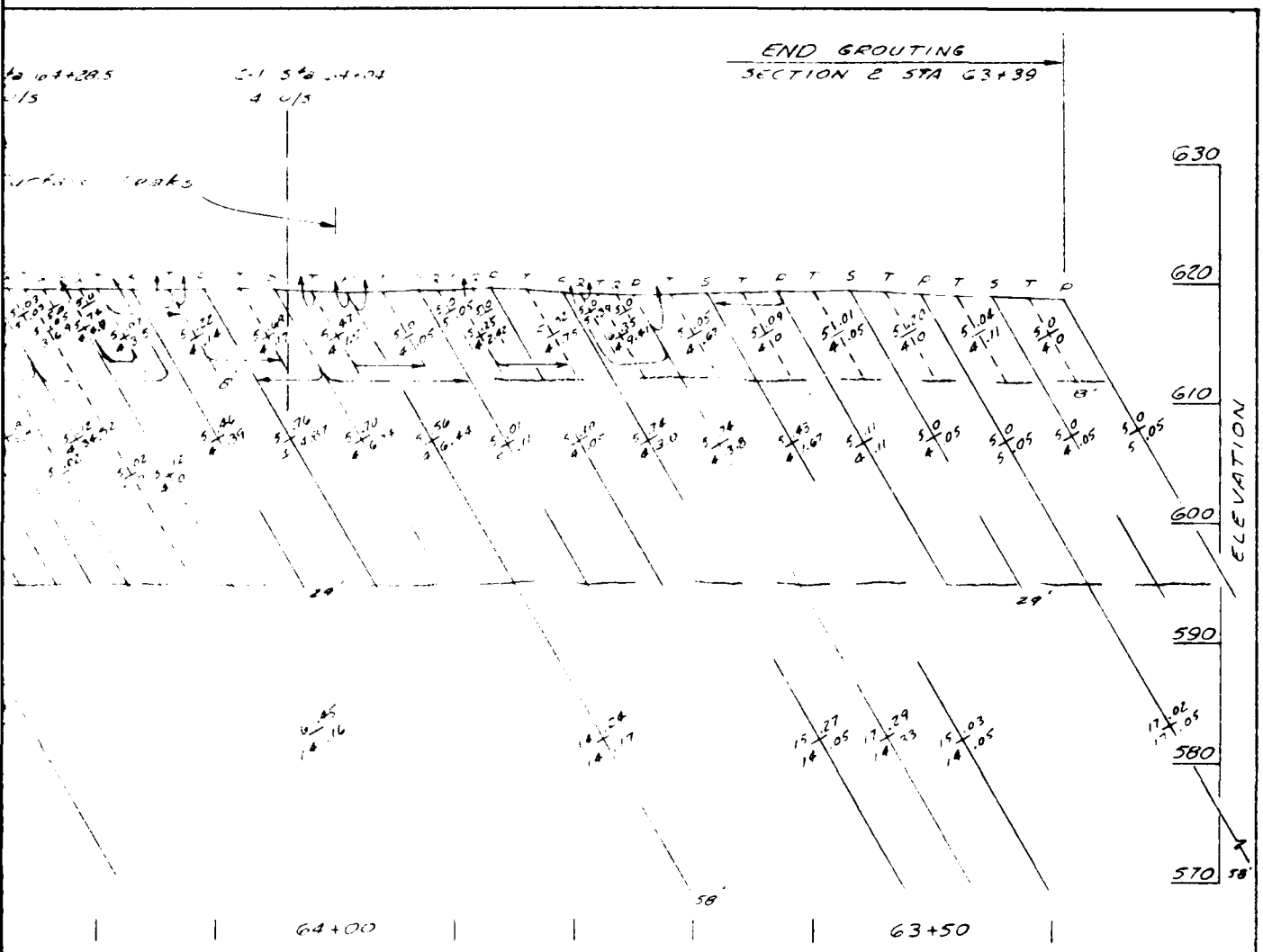
LOOKING DOWNSTREAM

Grout Line is on Dam axis

For Legend See Plate 106

0 10

SCALE IN FEET



[illegible] grout @ 63+33 m [illegible] While grouting [illegible] leak at 63+96 ℄ 4' o/s [illegible] 64+33 [illegible] While grout [illegible] 1+05 leaks [illegible] ℄ to 64+11. [illegible] grouting 64+11 surface leaks [illegible] grouting 64+14 surface leak at [illegible] ℄ 64+09 ℄ 1'-3' o/s. While grouting 64+10 leaks 64+14 ℄ 3' u/s ℄ 64+33 [illegible] o/s. While grouting 64+23 grout leak [illegible] While grouting 64+23 leaks at [illegible] ℄ 64+53 on [illegible] ℄ 64+34 ℄ 64+56 line B ℄ 64+37 on [illegible] many surface leaks.

While grouting 64+32 leaks at 64+38 4' o/s ℄ 64+46 ℄ 64+38. While grouting 64+35 leaks at surface between 64+53 line C ℄ B ℄ at 64+36 line B. While grouting 64+38 leaks at 64+26, 64+28, 64+32, 64+44 ℄ C-2. While grouting 64+68 leaks 5' o/s to 12' u/s ℄ 64+70 5' u/s. While grouting 64+98 leaks at 65+04, 65+10 10' u/s ℄ 65+01 5' ℄ 12' u/s.

	Drill	Sacks	I	II	III
14 Primary	637'	30.25	4.90	18.63	6.72
14 Secondary	464'	93.71	0	93.61	0.10
14 Tertiary	371'	97.53	97.20	0.33	0

63+39 TO STA 65+04

10

FEET

Revisions			
Symbol	Descriptions	Date	Approved

U. S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

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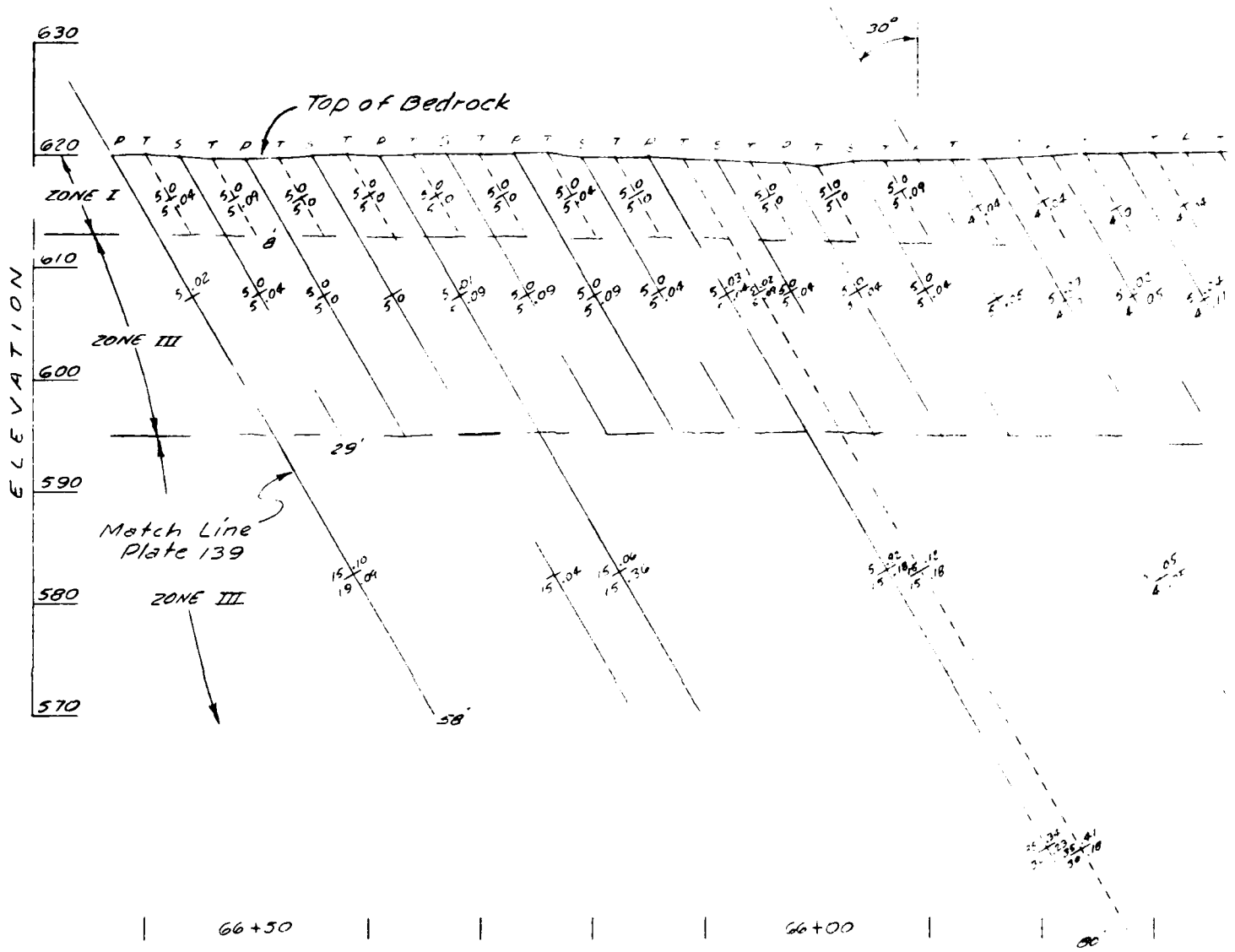
HARRY S. TRUMAN DAM & RESERVOIR
CONSTRUCTION FOUNDATION REPORT
GROUTING LINE C
STA. 63+39 TO STA. 64+04

Scale: AS SHOWN
Date: MARCH 1966
Sheet number
Dwg No. 96-0-12-9267

PLATE NO. 137



	Drill	Sacks	I	II	III
14 Primary	652'	1.25	0	0.84	1.68
13 Secondary	435'	1.25	0	1.08	0.17
27 Tertiary	288'	1.05	0.60	0.09	0.36

STAGE VI GROUTING LINE STA 65+04 TO STA 66

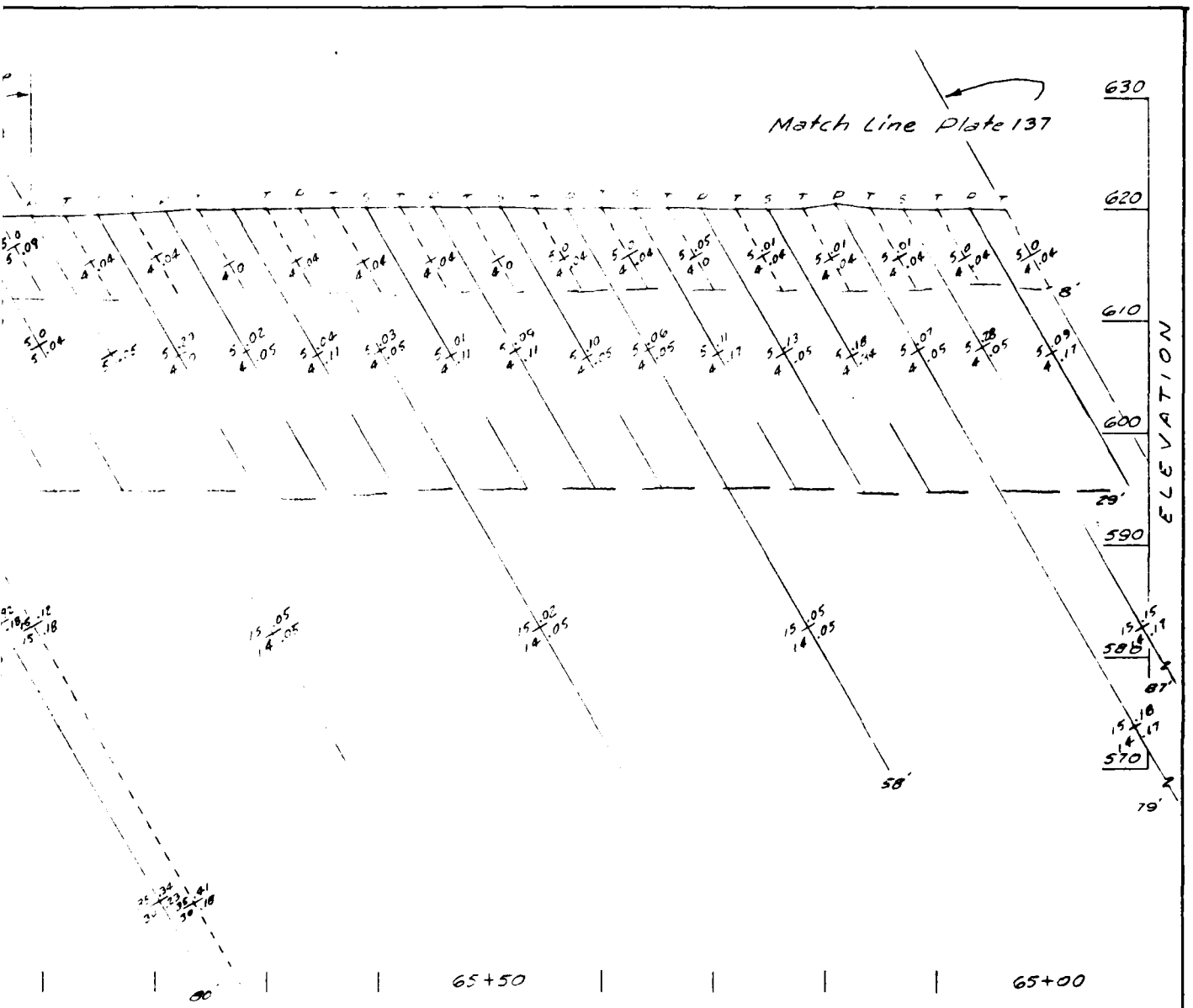
LOOKING DOWNSTREAM

Grout Line [illegible] Dam Axis

For Legend See Plate 106

0 10

SCALE IN FEET



65+04 TO STA 66+63

Revisions			
Symbol	Descriptions	Date	Approved

U. S. ARMY ENGINEER DISTRICT
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KANSAS CITY, MISSOURI

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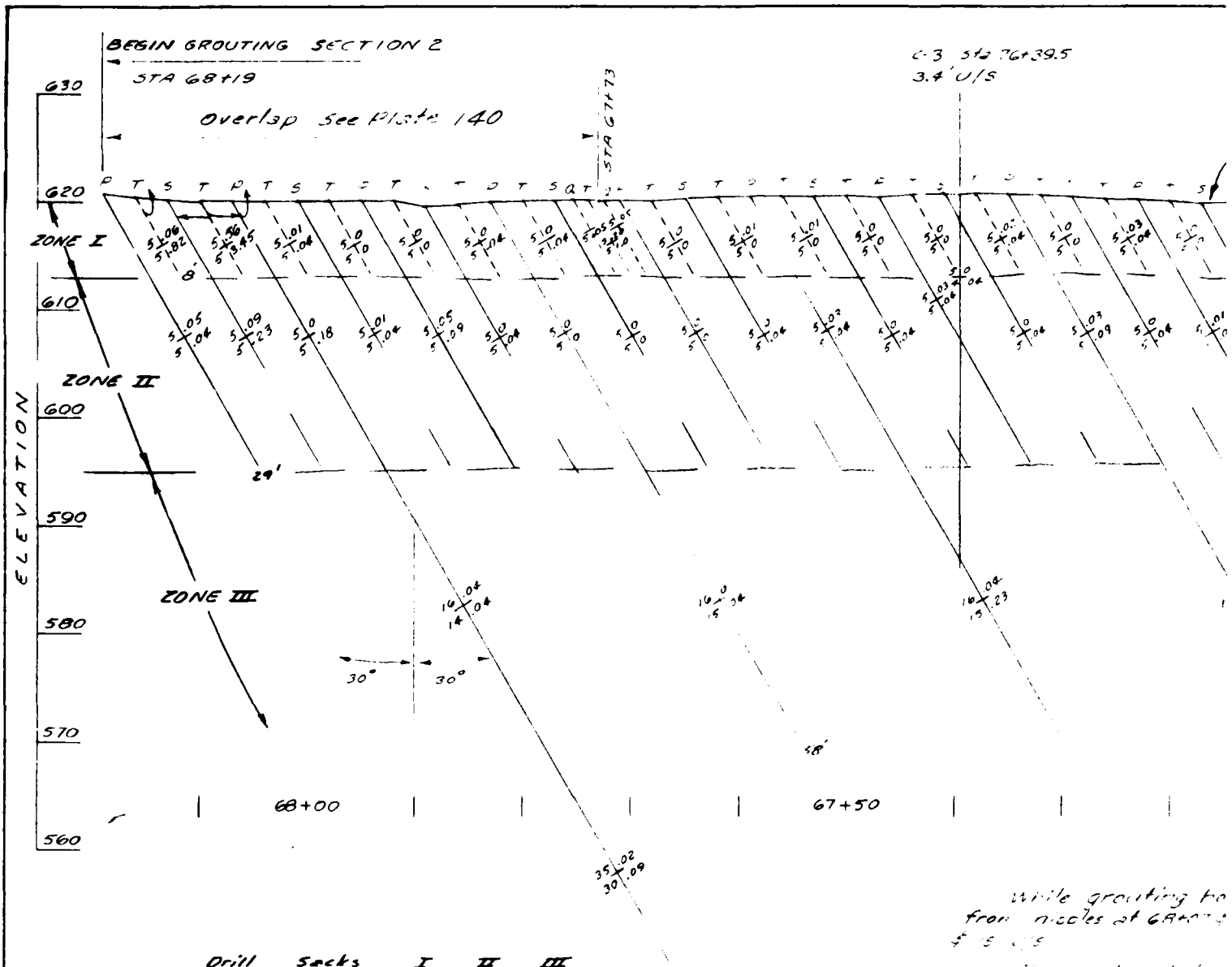
HARRY S. TRUMAN DAM & RESERVOIR
CONSTRUCTION FOUNDATION REPORT

GROUTING LINE C
STA. 65+04 TO STA. 66+63

Scale AS SHOWN
Date MARCH 1986
Sheet number
Dwg No.
File No. 0-12-9266

PLATE NO. 138



		Drill	Sacks	I	II	III
13	Primary	607'	1.51	0	0.60	0.91
13	Secondary	377'	0.55	0	0.55	0
26	Tertiary	208'	4.75	4.75	0	0
2	Quaternary	16'	0.10	0.10	0	0

While grouting ho
from nozzles at GA
5' 5 1/2

While grouting hole
68+16 on line E

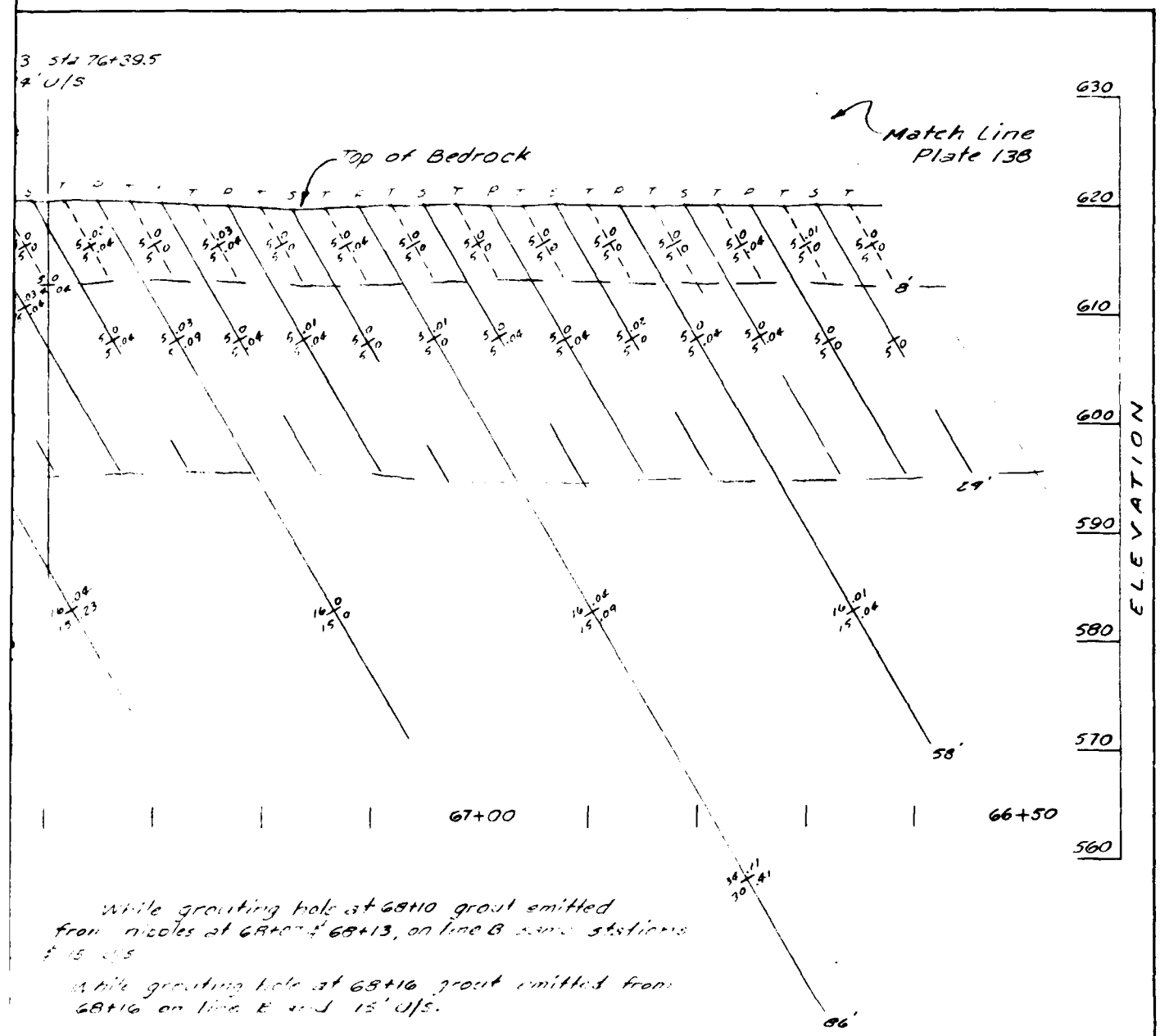
STAGE VI GROUTING LINE C STA 66+63 TO

LOOKING DOWNSTREAM

Grout Line is on Dam Axis

For Legend See Plate 06

0 10
SCALE IN FEET



While grouting hole at 68+10 grout emitted from nipples at 68+07 & 68+13, on line B same stations 5' U/S

While grouting hole at 68+16 grout emitted from 68+16 on line E and 15' U/S.

STA 66+63 TO STA 68+19

TAM

10

FEET

Revisions			
Symbol	Descriptions	Date	Approved

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CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

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HARRY S. TRUMAN DAM & RESERVOIR
CONSTRUCTION FOUNDATION REPORT

GROUTING LINE C
STA. 66+63 TO STA. 68+19

Scale: AS SHOWN

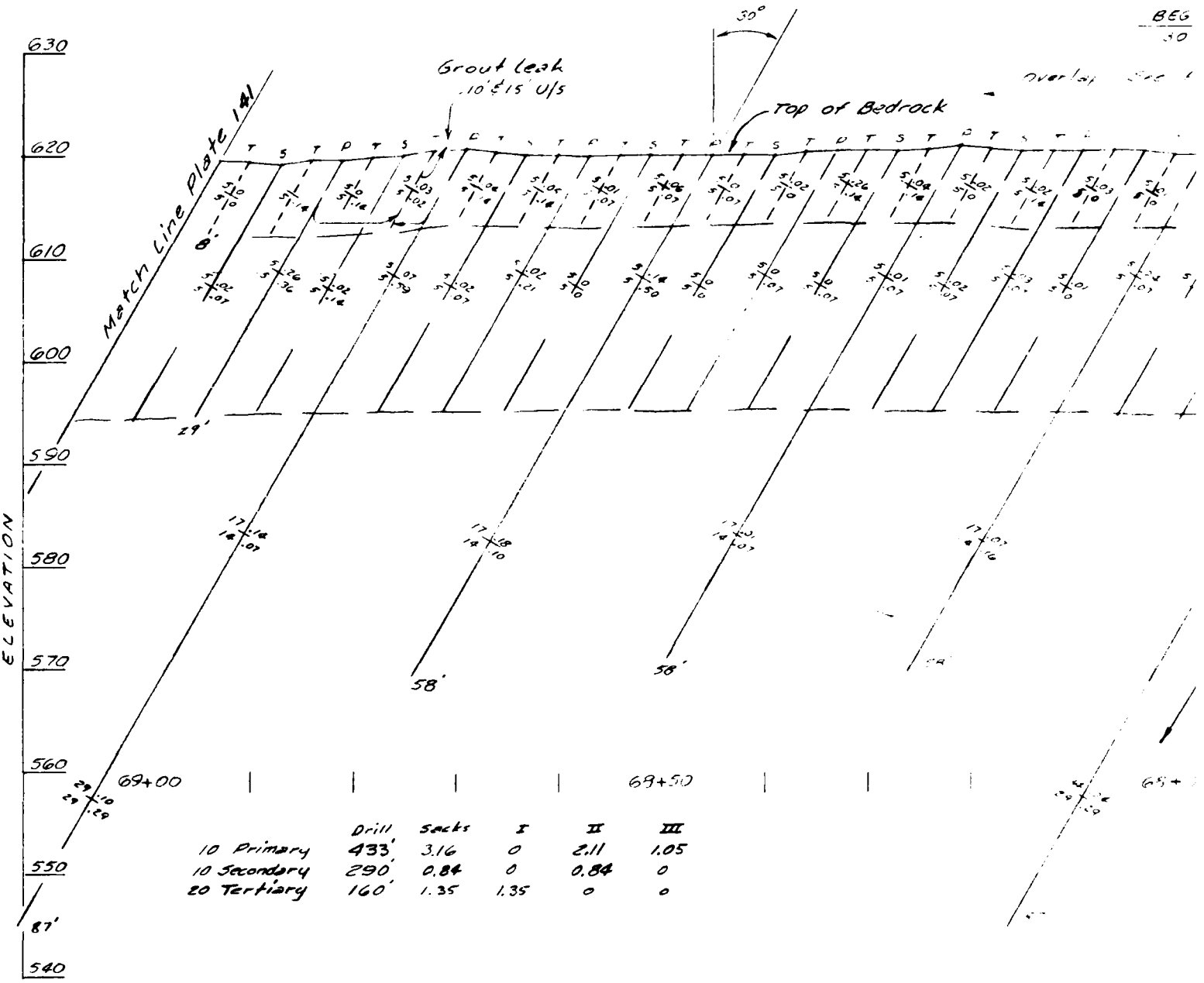
Date: MARCH 1968

Sheet number:

Dwg No.

FILE NO. 0-12-9269

PLATE NO. 139



STAGE VI GROUTING LINE C STA 67+73 TO STA

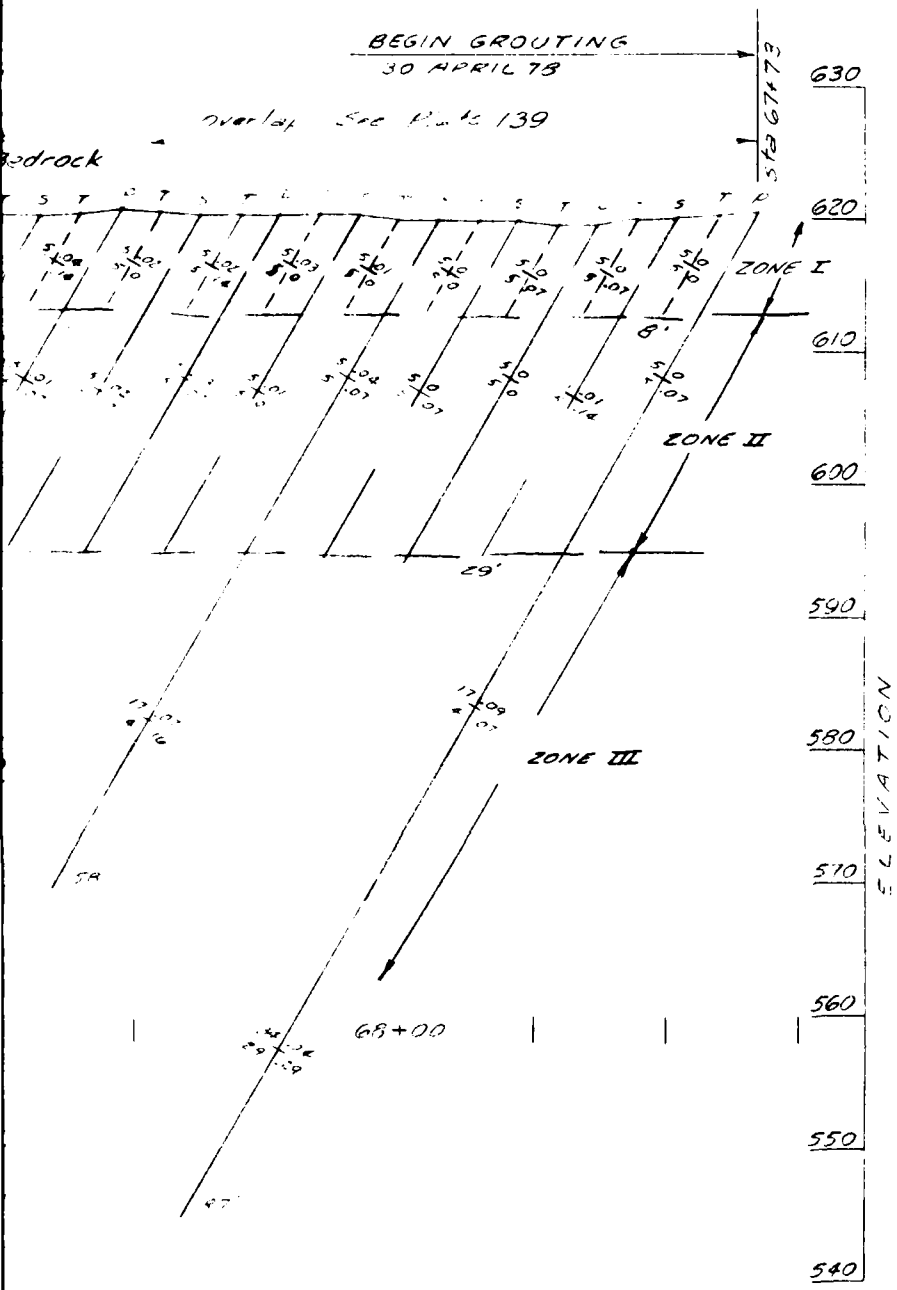
LOOKING DOWNSTREAM

Grout Line is on Dam Axis

For Legend See Plate 106

0 10

SCALE IN FEET



STA 67+73 TO STA 68+93

Revisions			
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U. S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

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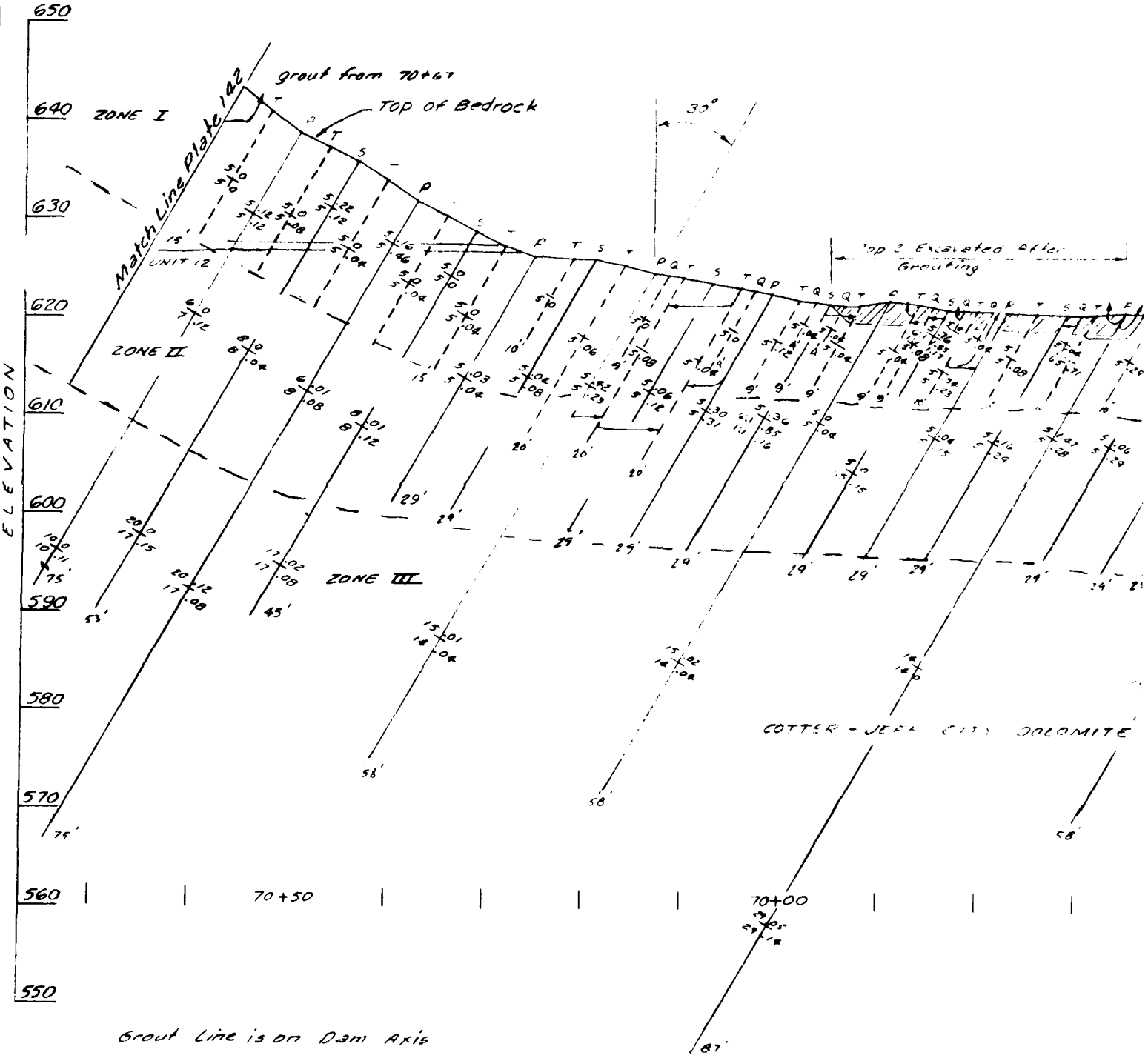
CONSTRUCTION FOUNDATION REPORT

GROUTING LINE C
STA. 67+73 TO STA. 68+93

Scale AS SHOWN
Date MARCH 1986
Sheet number
Dwg No.
FILE No. 0-12-9270

PLATE NO. 140

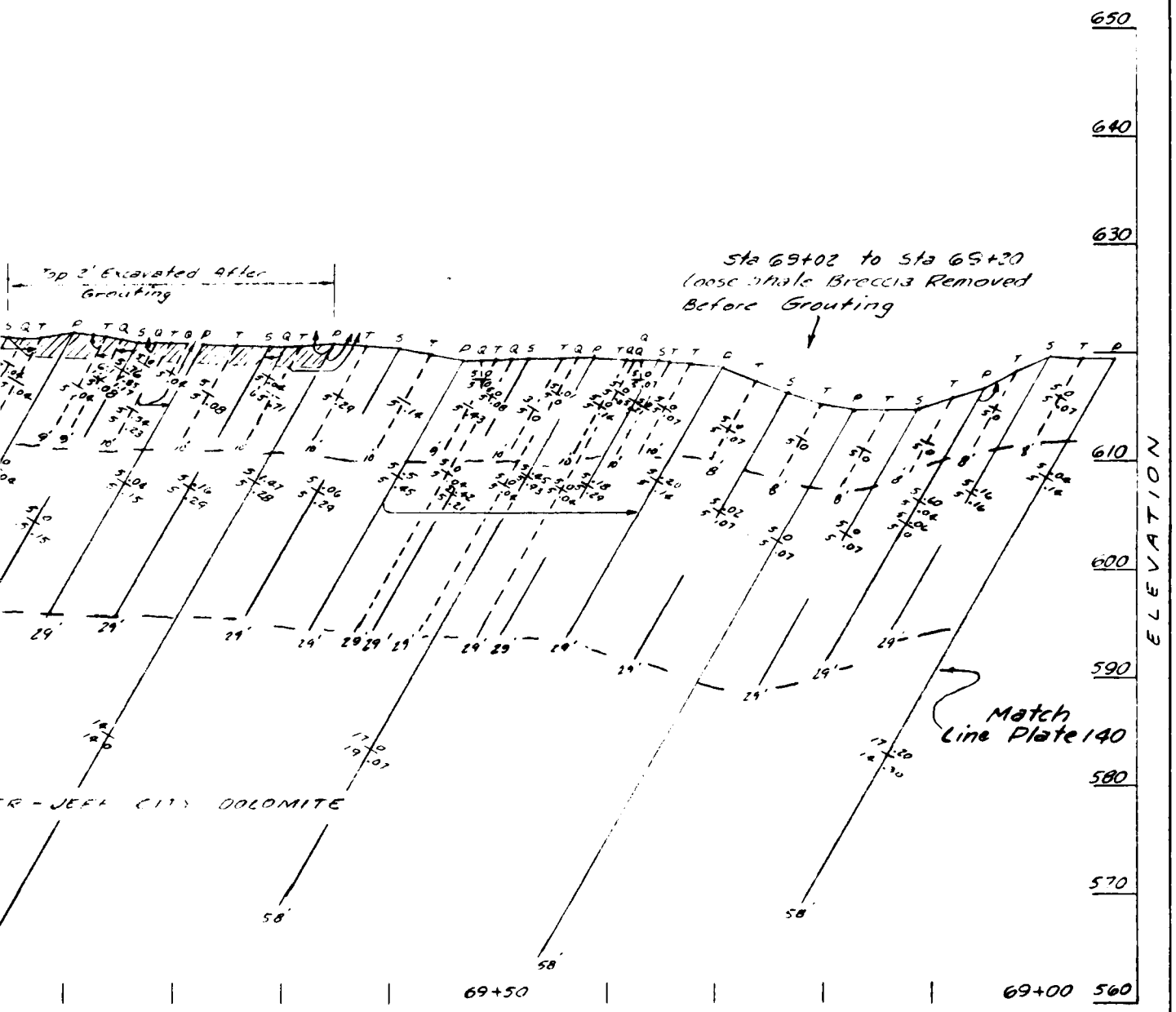


STAGE VI GROUTING LINE [illegible]

LOOKING DOWNSTREAM

For Legend See Plate 106

	Drill	Sacks	I	II	III
14 Primary	701'	4.63	0.58	3.27	0.78
13 Secondary	417'	6.98	3.35	2.90	0.23
28 Tertiary	319'	3.36	3.36	0	0
14 Quaternary	165'	1.21	1.17	0.04	0



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HARRY S. TRUMAN DAM & RESERVOIR
CONSTRUCTION FOUNDATION REPORT

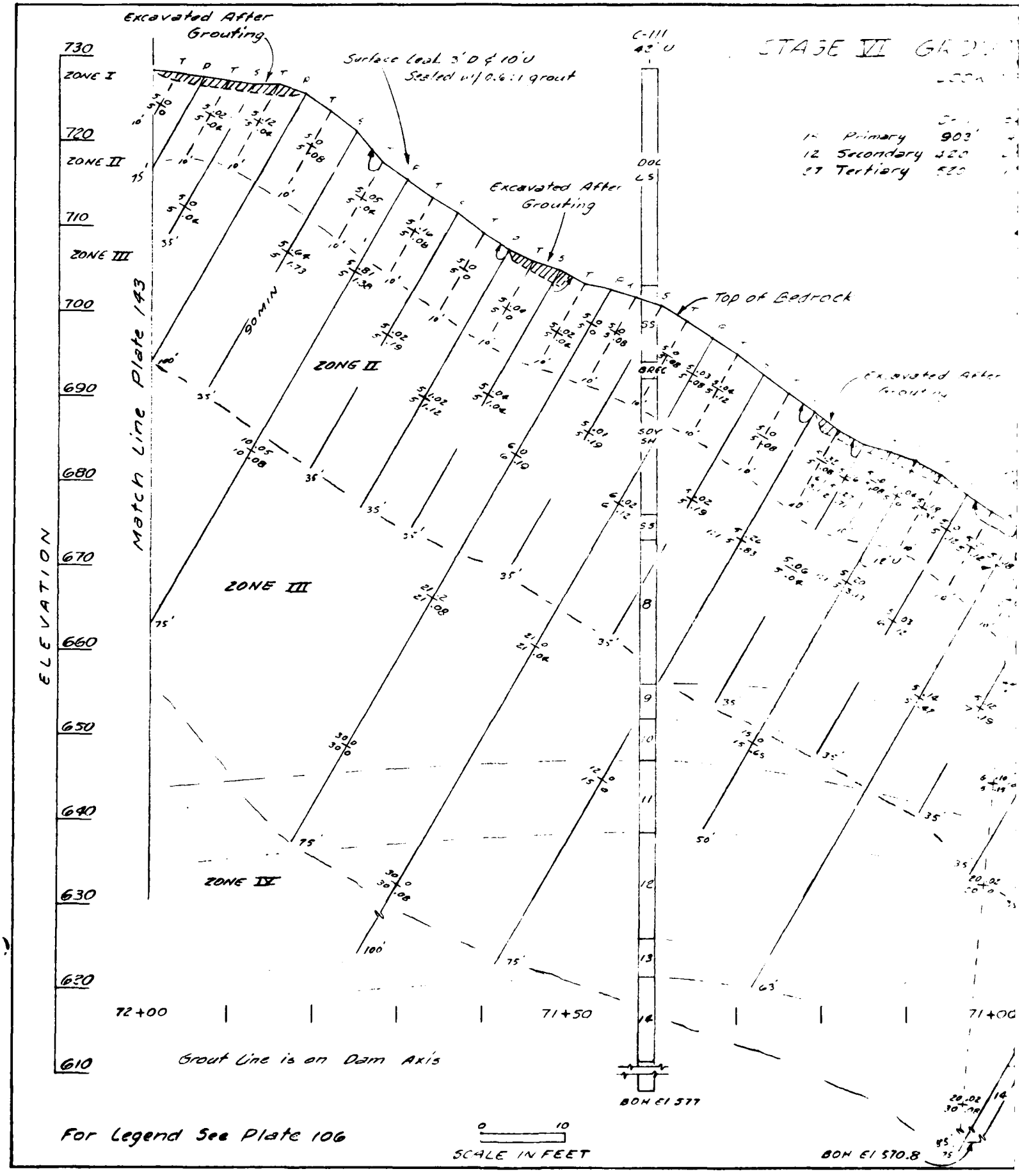
GROUTING LINE C
STA. 68+93 TO STA. 70+55

Scale: AS SHOWN
Date: MARCH 1966
Sheet number:
Dwg No.
FILE NO. 0-12-9271

STA 68+93 TO STA 70+55
TREAM

0 10
SCALE IN FEET

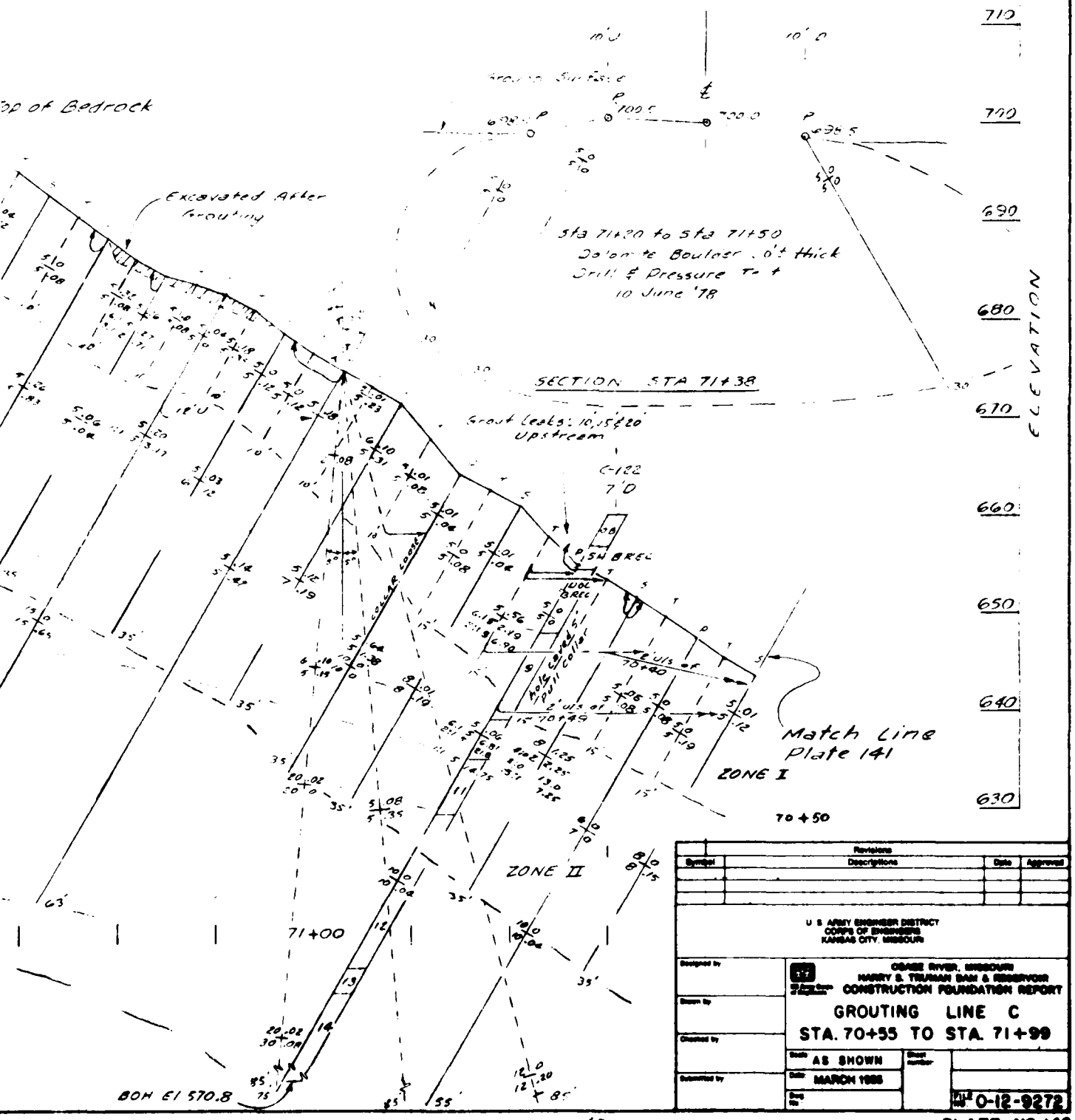
PLATE NO. 141


Excavated After Grouting
Surface Seal 3'D & 10'U
Sealed w/ 0.6:1 grout
C-111
42' U
STAGE VI
Primary 903'
Secondary
Tertiary
Excavated After Grouting
Top of Bedrock
Excavated After Grouting
ZONE I
ZONE II
ZONE III
ZONE IV
Match Line Plate 143
ELEVATION
730
720
710
700
690
680
670
660
650
640
630
620
610
72+00
71+50
71+00
Grout Line is on Dam Axis
BOH El 577
BOH El 570.8
For Legend See Plate 106
SCALE IN FEET
0
10

STAGE VI GROUTING LINE C STA 70+55 TO STA 71+99

LOOKING DOWNSTREAM

		Drill	Sacks	I	II	III	IV
1	Primary	903'	45.07	0.20	43.86	0.93	0.08
12	Secondary	420'	28.14	1.57	26.57	0	0
27	Tertiary	520'	12.00	11.22	0.15	0.35	0.28



Revisions			
Symbol	Descriptions	Date	Approved

U S ARMY ENGINEER DISTRICT
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KANSAS CITY, MISSOURI

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Drawn by
Checked by
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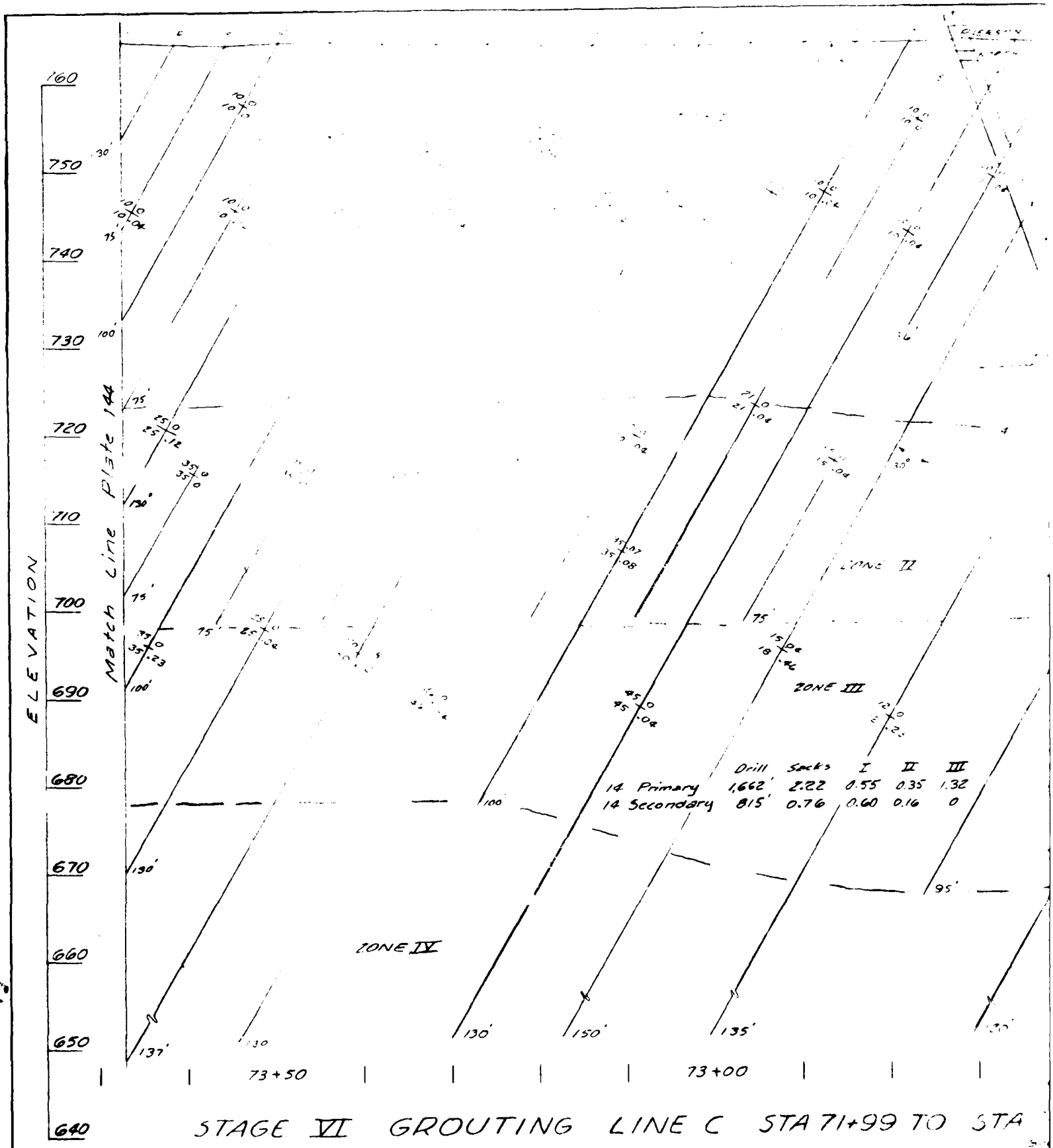
HARRY S. TRUMAN DAM & RESERVOIR
CONSTRUCTION FOUNDATION REPORT

GROUTING LINE C
STA. 70+55 TO STA. 71+99

Scale: AS SHOWN
Date: MARCH 1986
Sheet number
Dwg No.
File No. 0-12-9272

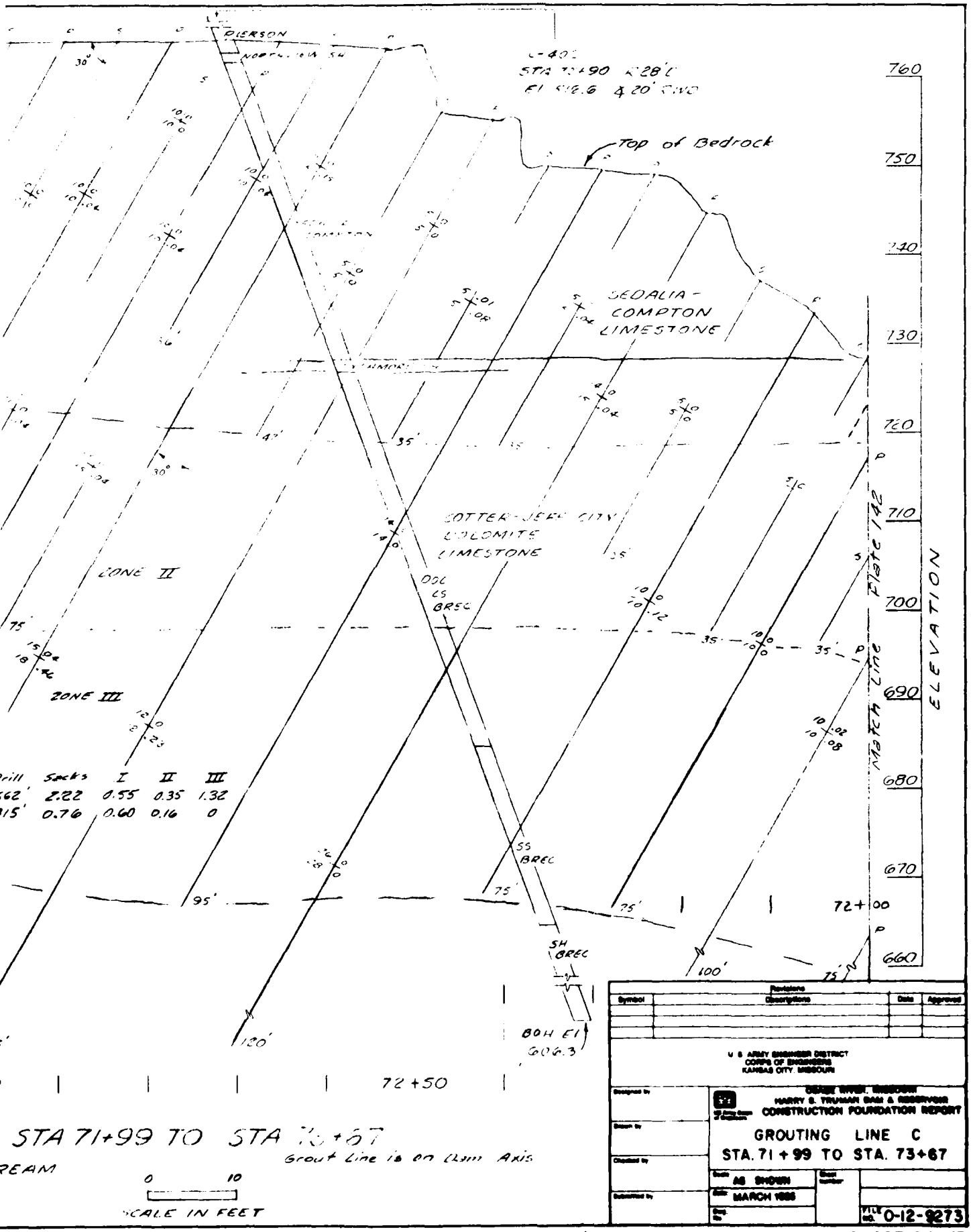
PLATE NO. 142



STAGE VI GROUTING LINE C STA 71+99 TO STA

LOOKING DOWNSTREAM

For Legend See Plate 106


PIERSON
NORTHWESTERN SH
C-40
STA 72+90 R 28'C
El 812.6 & 20' RWD
Top of Bedrock
SEDALIA-
COMPTON
LIMESTONE
SOTTER-JEFF CITY
DOLOMITE
LIMESTONE
ZONE II
ZONE III
DOL
LS
BREC
SS
BREC
SH
BREC
BOH El
606.3
Drill Sacks I II III
62' 2.22 0.55 0.35 1.32
15' 0.76 0.60 0.16 0
95'
120'
100'
75'
35'
42'
30°
72+00
72+50
760
750
740
730
720
710
700
690
680
670
660
ELEVATION
Match Line Plate 142
STA 71+99 TO STA 73+67
Grout Line is on Line Axis
REAM
0 10
SCALE IN FEET
Revisions
Symbol
Description
Date
Approved
U. S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI
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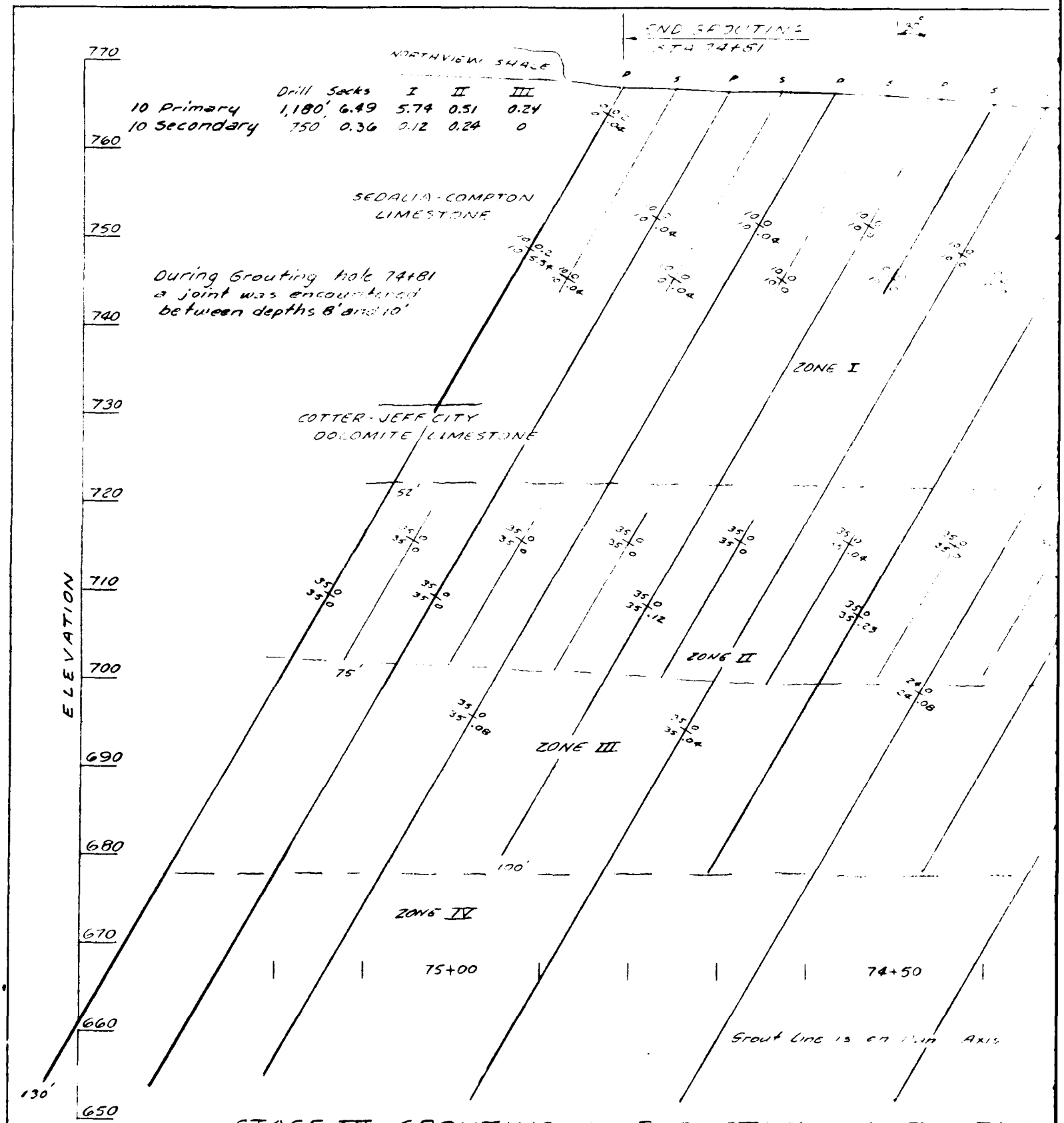
CONSTRUCTION FOUNDATION REPORT
GROUTING LINE C
STA. 71 + 99 TO STA. 73+67
Scale AS SHOWN
Date MARCH 1966
File No. 0-12-9273

PLATE NO. 143

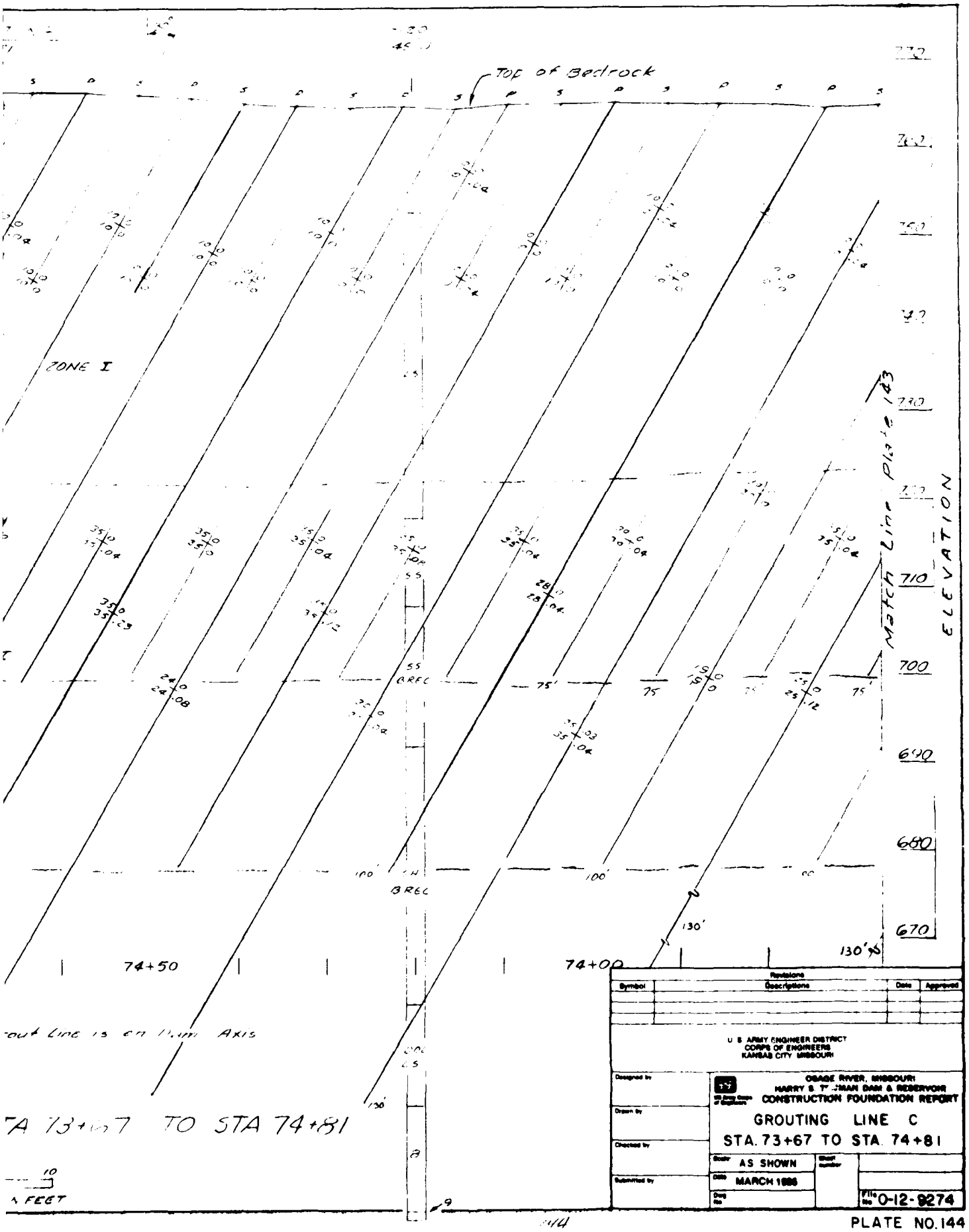


STAGE VI GROUTING LINE C STA 73+67 TO STA 74

LOOKING DOWNSTREAM

For Legend See Plate 106

0 10
SCALE IN FEET



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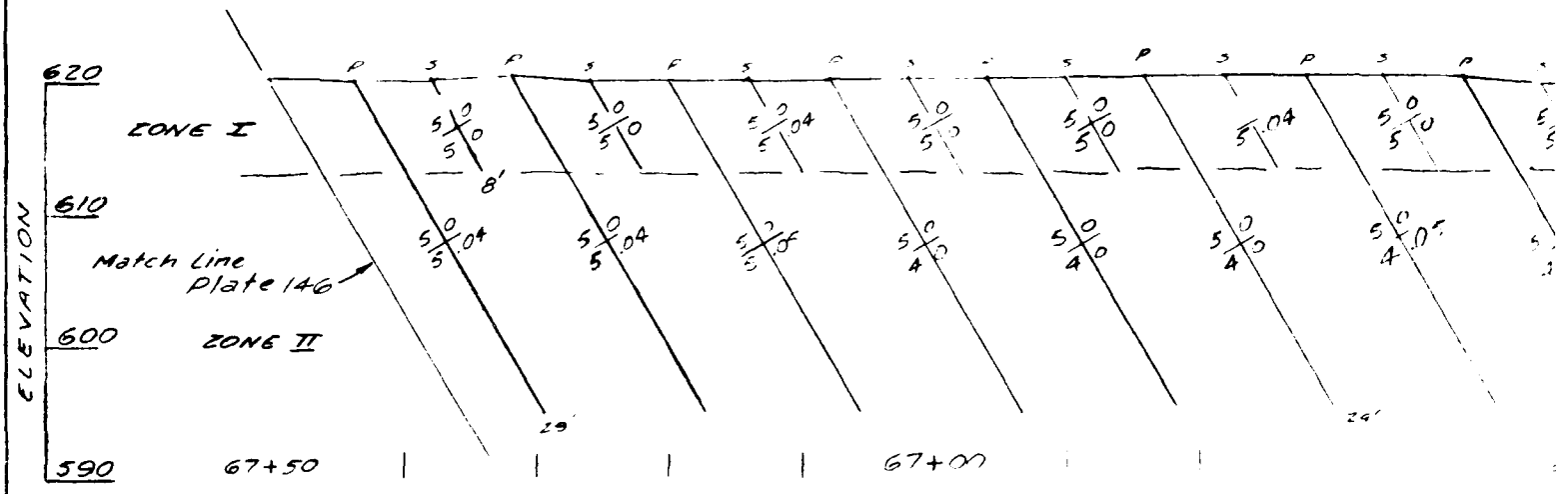
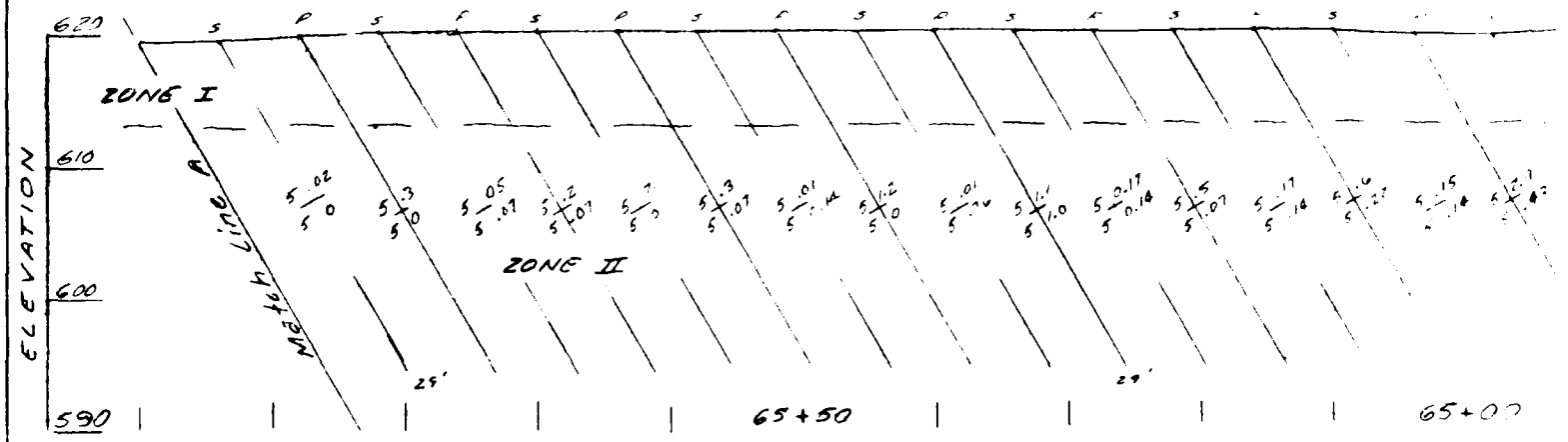
GROUTING LINE C
STA. 73+67 TO STA. 74+81

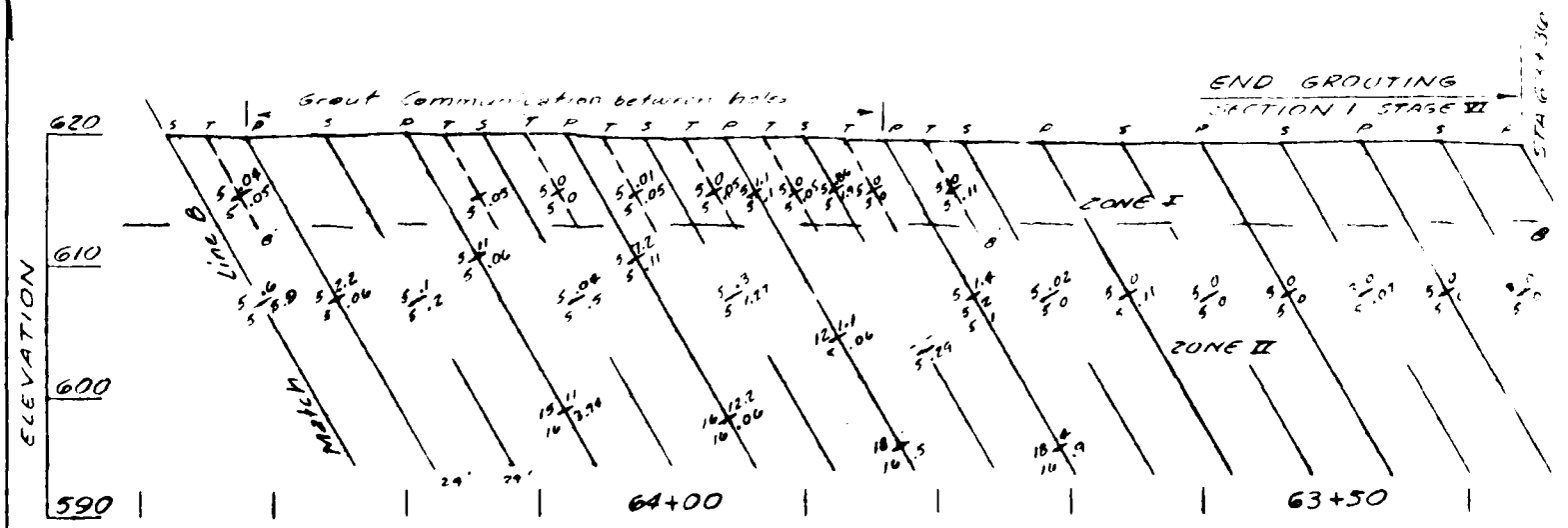
Scale: AS SHOWN
Date: MARCH 1986
Dwg No.
Sheet number
File No. 0-12-9274

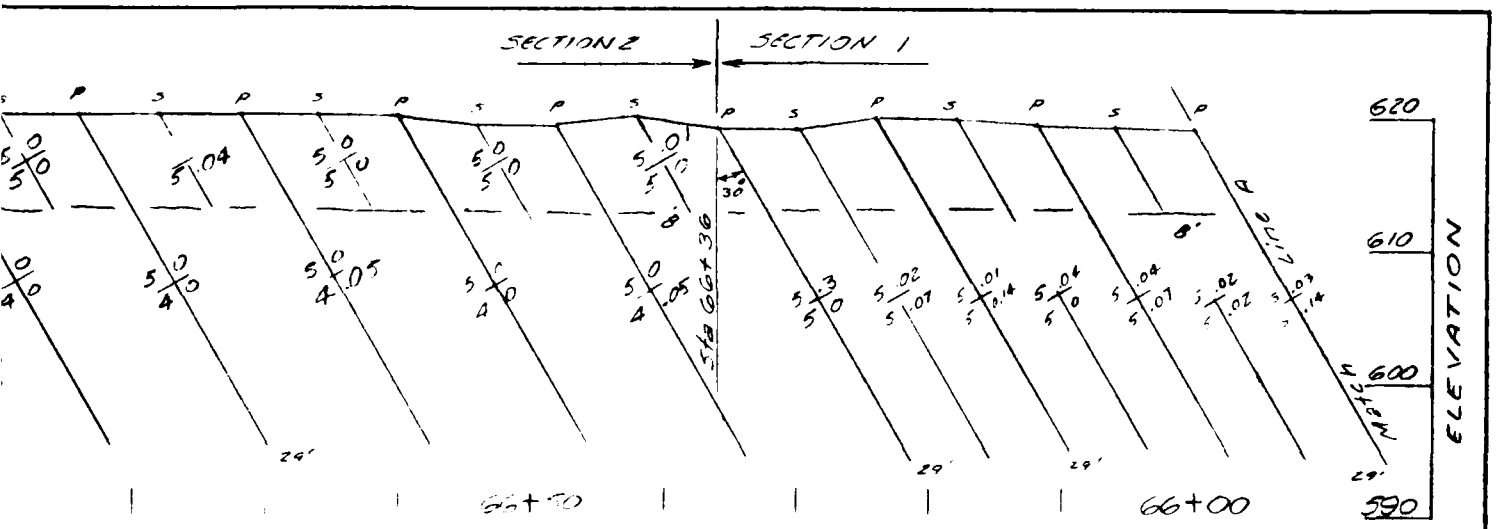
PLATE NO. 144



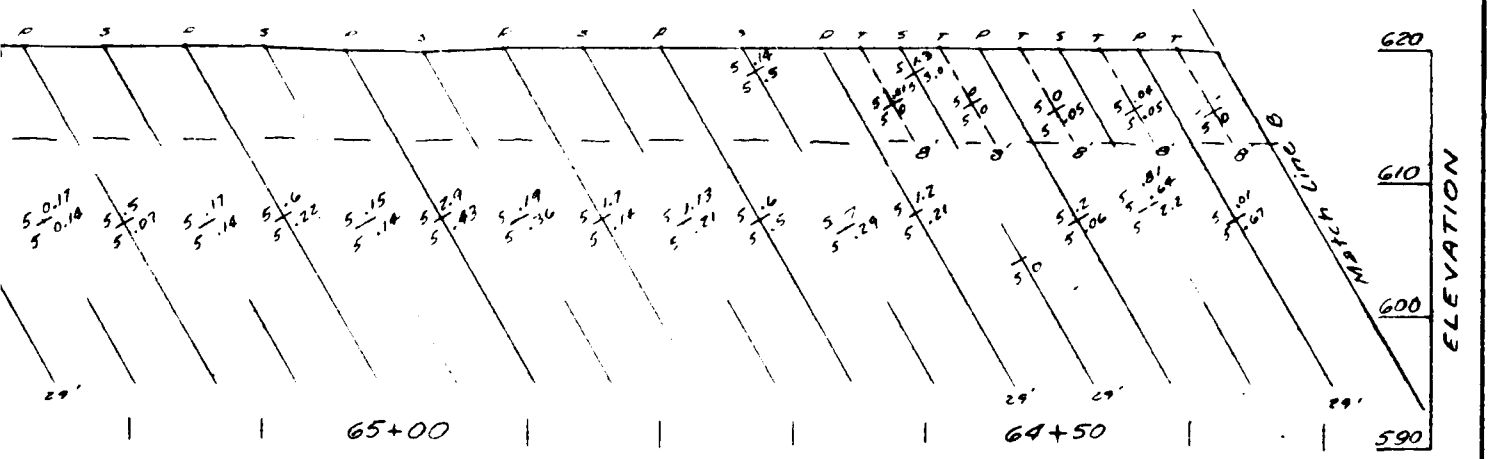
		Drill	Sacks
35	Primary	1,015'	13.14
34	Secondary	791'	17.95
13	Tertiary	104'	[illegible]







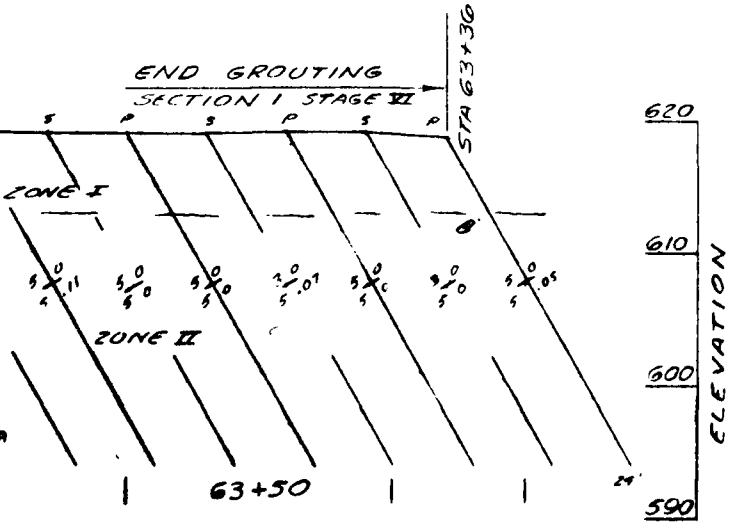
		Drill	Sacks	I	II
35	Primary	1,015'	13.14	0	13.14
34	Secondary	797'	17.95	5.53	12.42
13	Tertiary	104'	0.46	0.46	0



Grout Line is 10' D/S of Dam Axis

STAGE VI GROUTING LINE A
STA 63+36 TO STA 67+50

LOOKING DOWNSTREAM
For Legend See Plate 106



0 10
SCALE IN FEET

Revisions			
Symbol	Description	Date	Approved

U. S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

OSAGE RIVER, MISSOURI
HARRY S. TRUMAN DAM & RESERVOIR
CONSTRUCTION FOUNDATION REPORT

GROUTING LINE A
STA. 63+36 TO STA. 67+50

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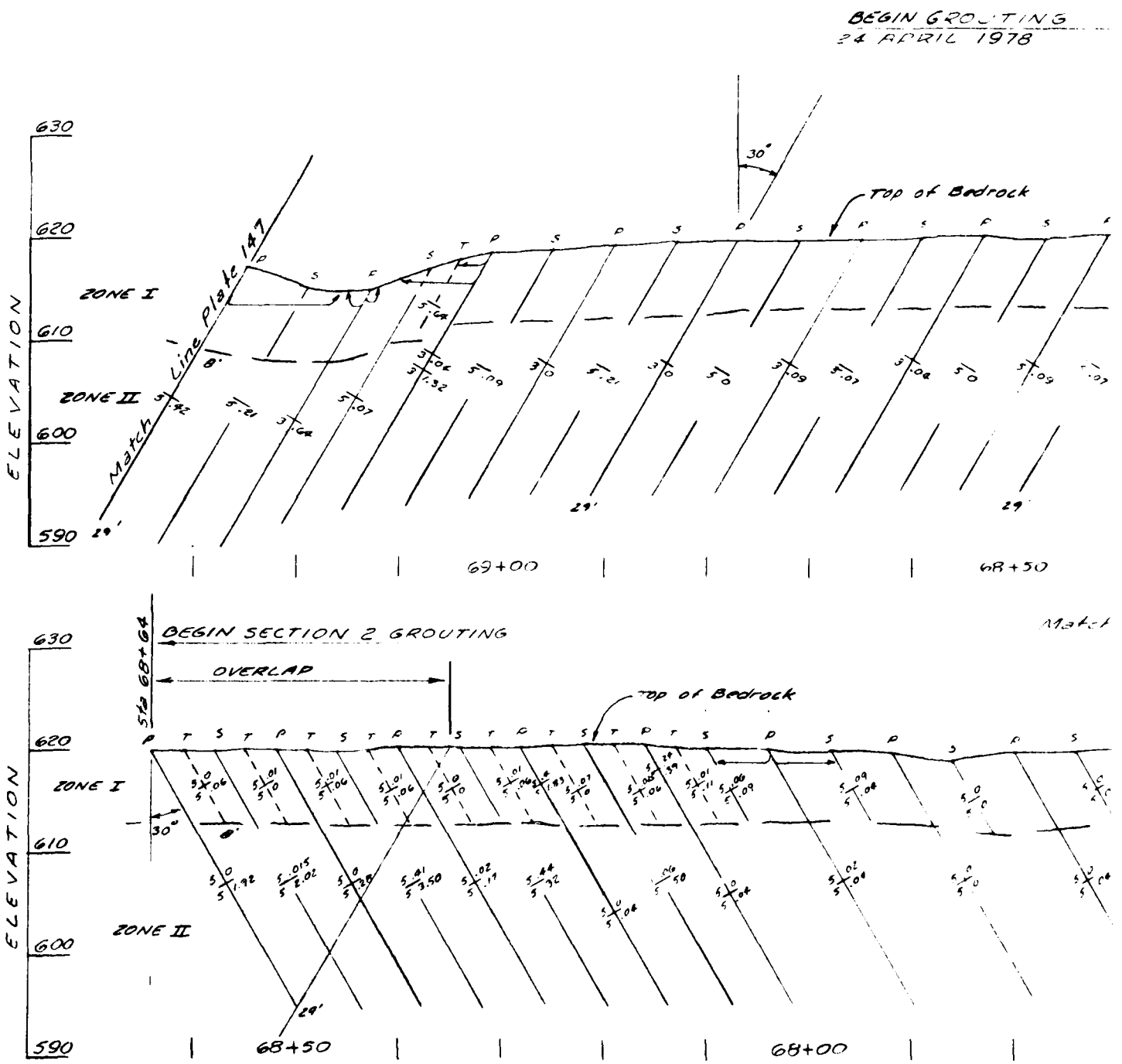
Scale: AS SHOWN
Date: MARCH 1966
Sheet number:
File No. 0-12-9275



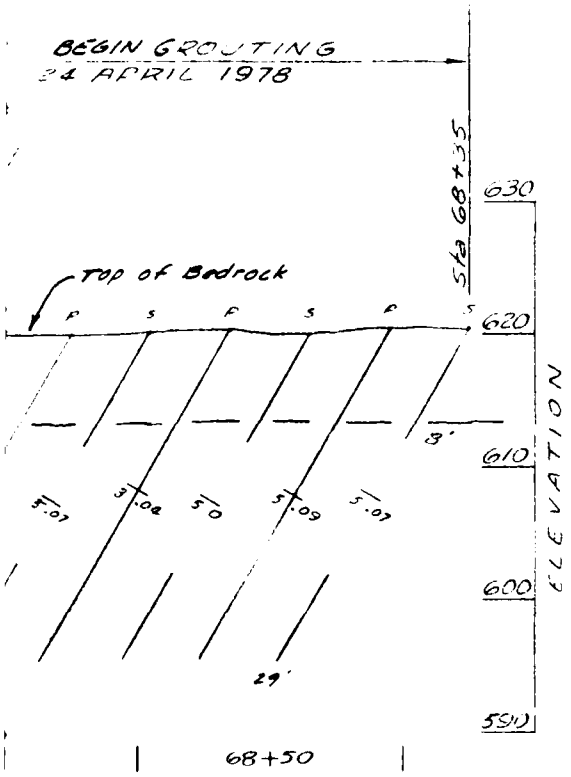
STAGE VI GROUTING LINE A STA 67+50 TO ST

LOOKING DOWNSTREAM

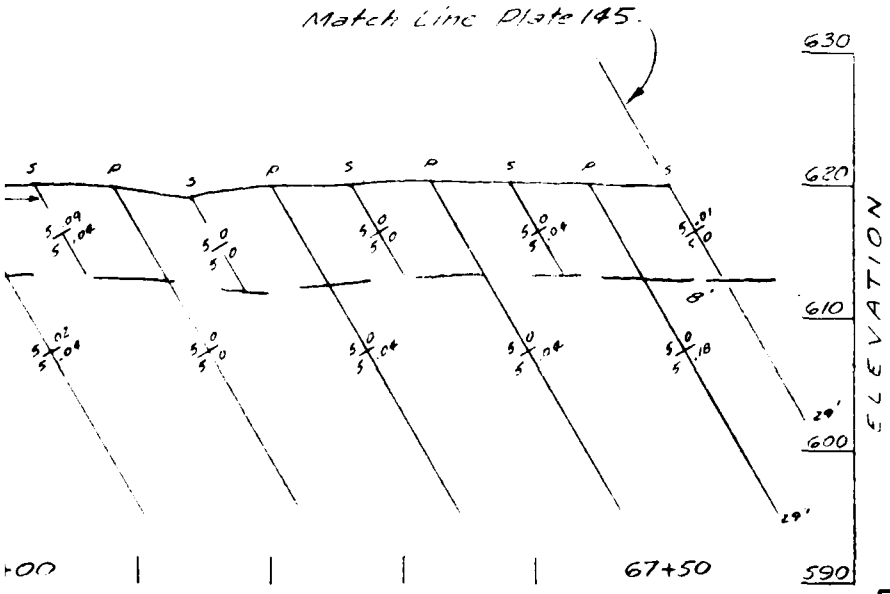
Grout Line is 10 0,

For Legend See Plate 106

0 10
SCALE IN FEET



	Drill	Sacks	I	II
18 Primary	232'	5.39	0	5.39
18 Secondary	232'	7.23	0.17	7.06
10 Tertiary	80'	0.99	0.99	0



TA 67+50 TO STA 69+25

STREAM

Grout Line is 10' D/s of Dam Axis

0 10

LE IN FEET

Revisions			
Symbol	Descriptions	Date	Approved

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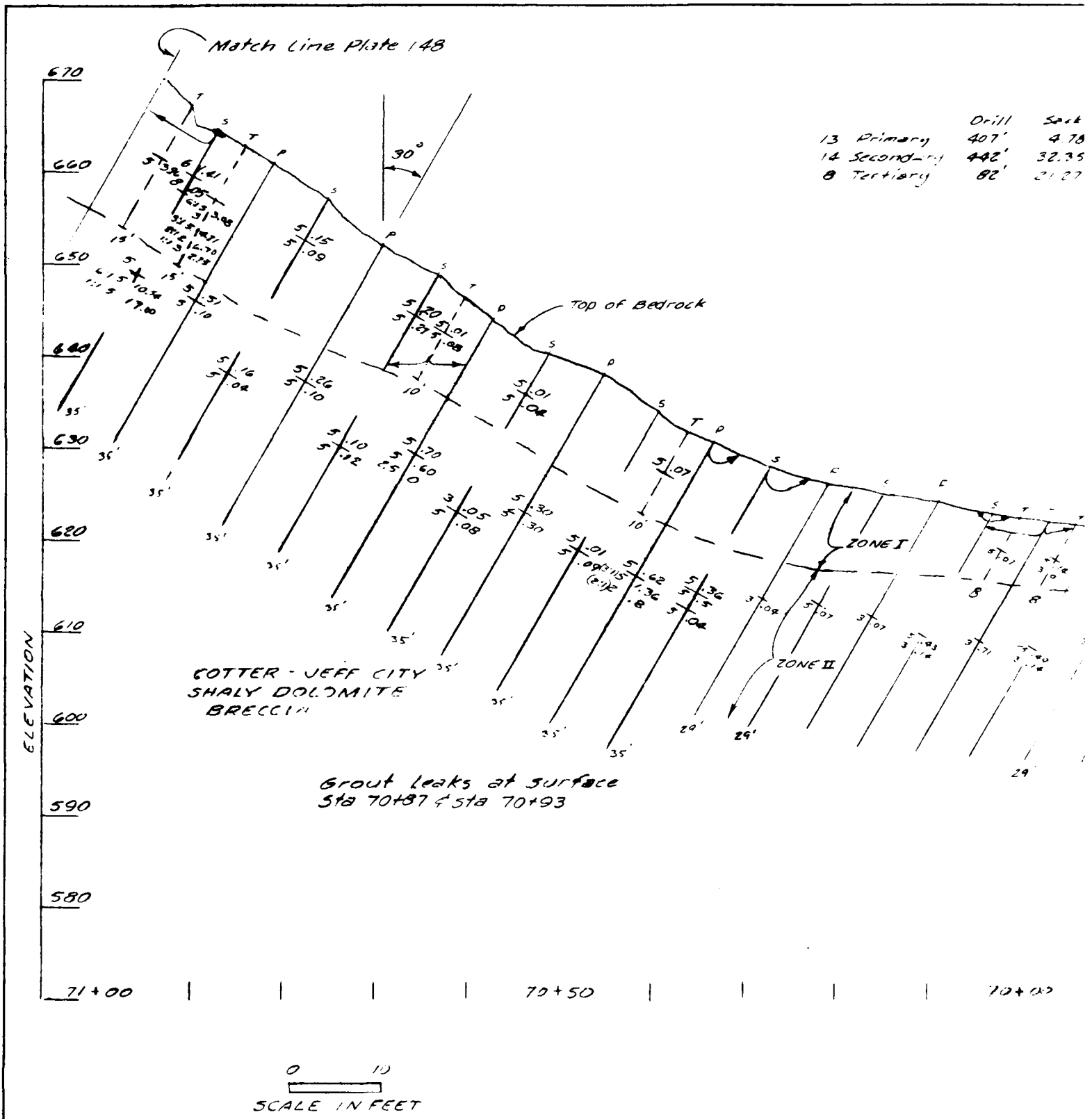
CONSTRUCTION FOUNDATION REPORT

GROUTING LINE A
STA. 67+50 TO STA. 69+25

Scale: AS SHOWN
Date: MARCH 1980
Sheet number:
File No.: 0-12-8276

PLATE NO. 146



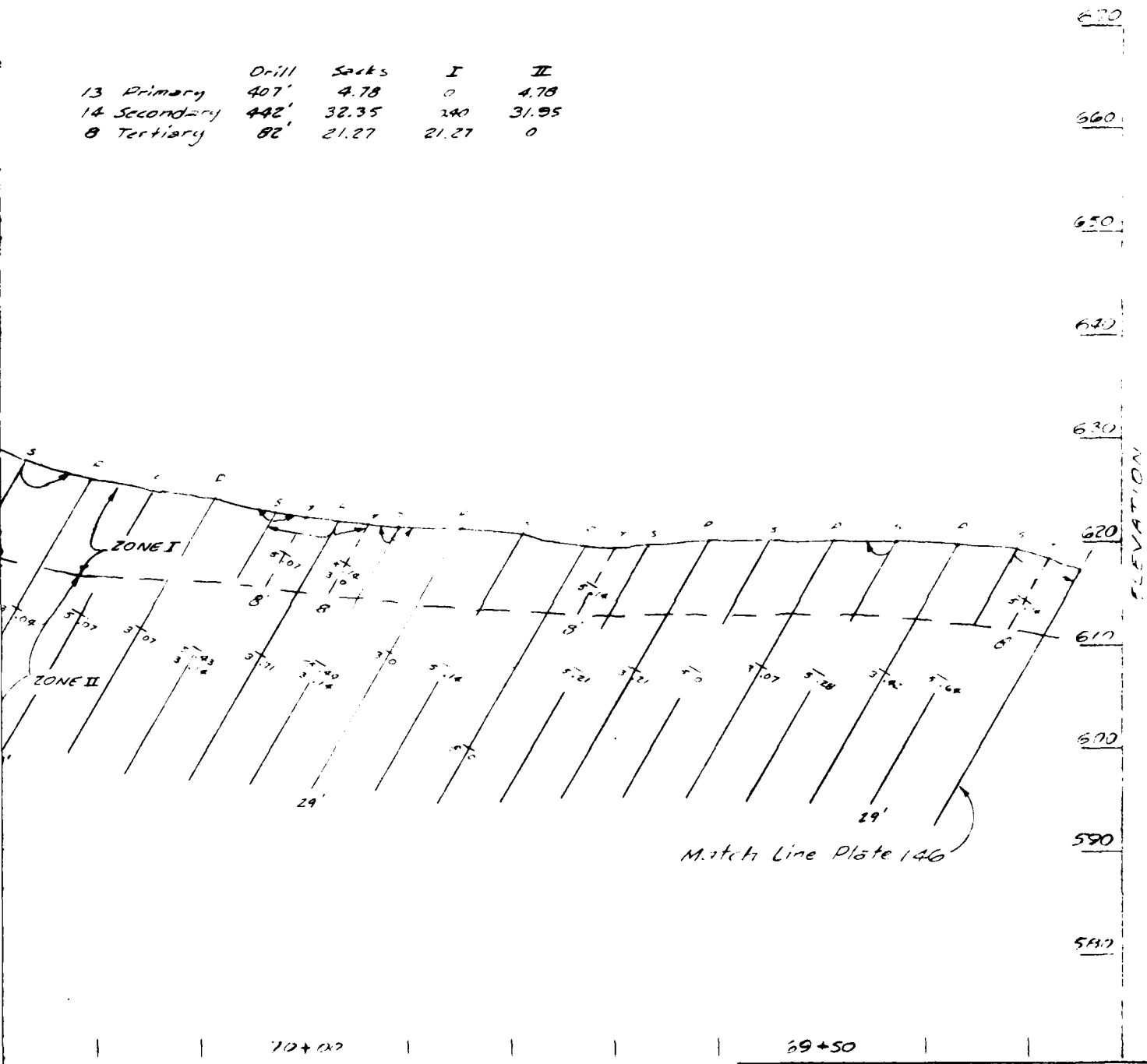
For Legend See Plate 106

STAGE VI GROUTING LINE A STA 6

LOOKING DOWNSTREAM

Grout

	Drill	Sacks	I	II
13 Primary	407'	4.78	0	4.78
14 Secondary	442'	32.35	240	31.95
8 Tertiary	82'	21.27	21.27	0



NG LINE A STA 69+25 TO STA 70+93

OKING DOWNSTREAM

Grout Line is 10' D/s of Dam Axis

Revisions			
Symbol	Descriptions	Date	Approved

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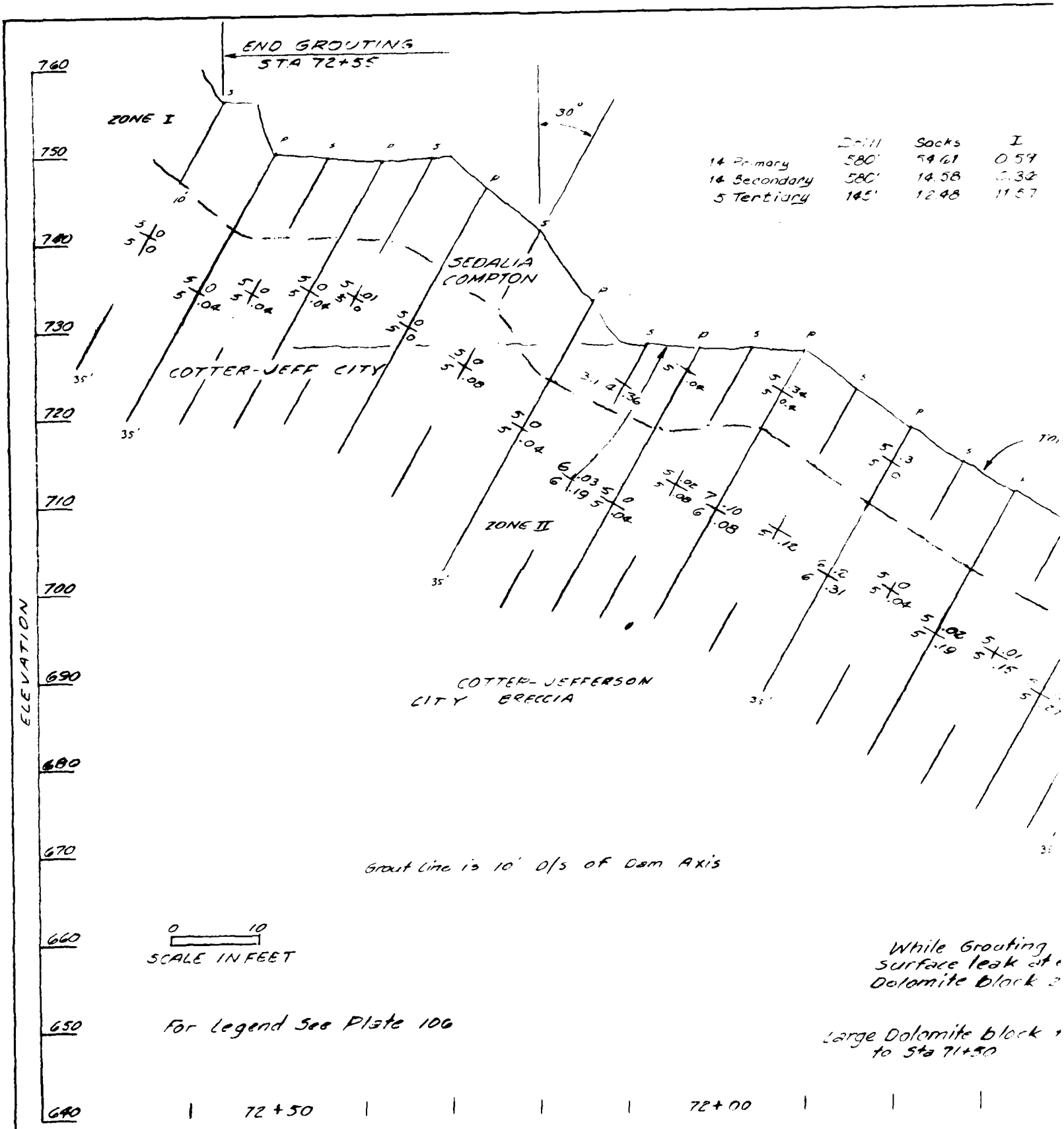
CONSTRUCTION FOUNDATION REPORT

GROUTING LINE A
STA. 69+25 TO STA. 70+93

Scale: AS SHOWN
Date: MARCH 1966
Dwg No.
Sheet number
File No. 0-12-9277

PLATE NO. 147



STAGE VI GROUTING LINE A STA

LOOKING DOWNSTREAM

Revisions			
Symbol	Descriptions	Date	Approved

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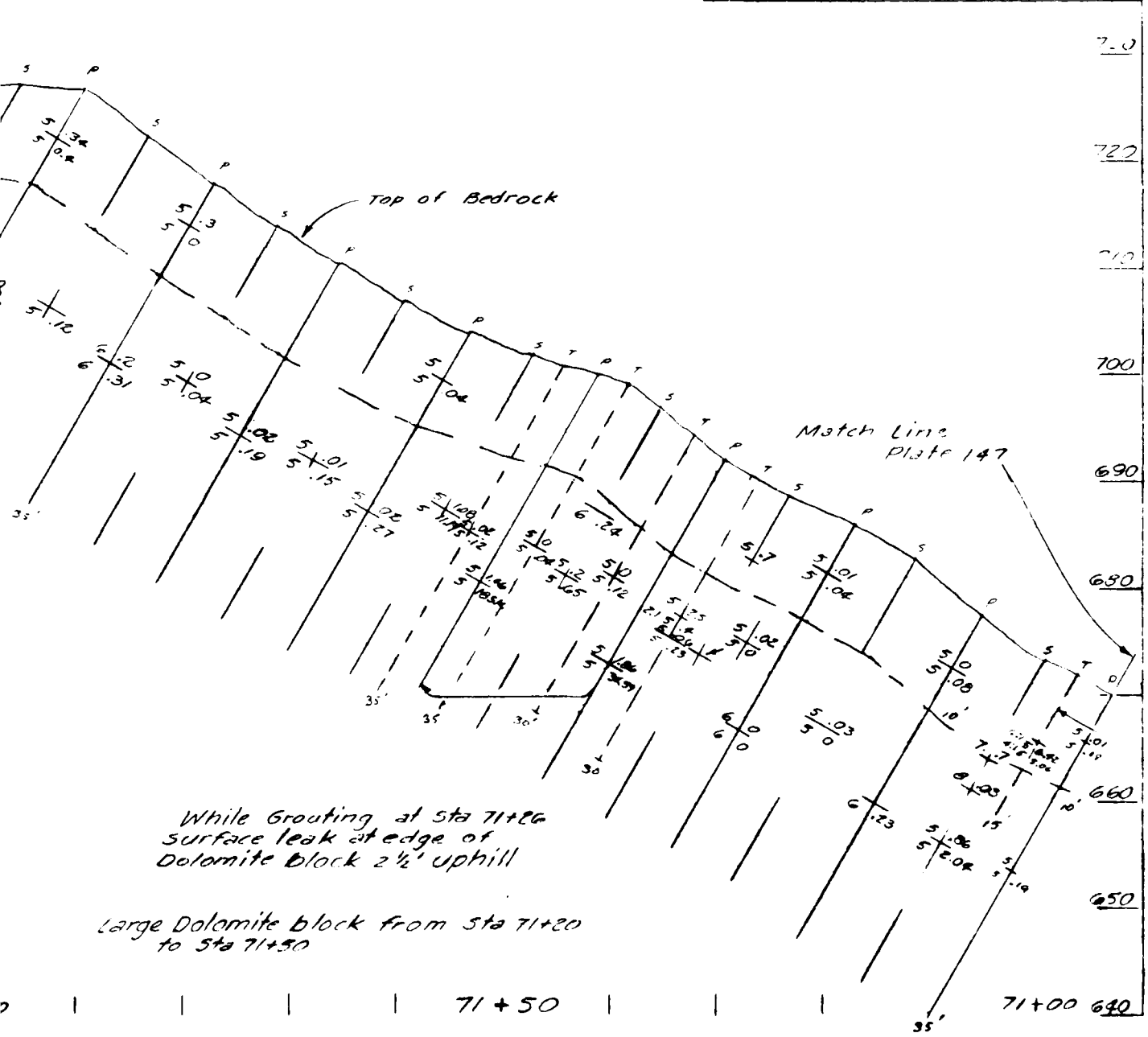
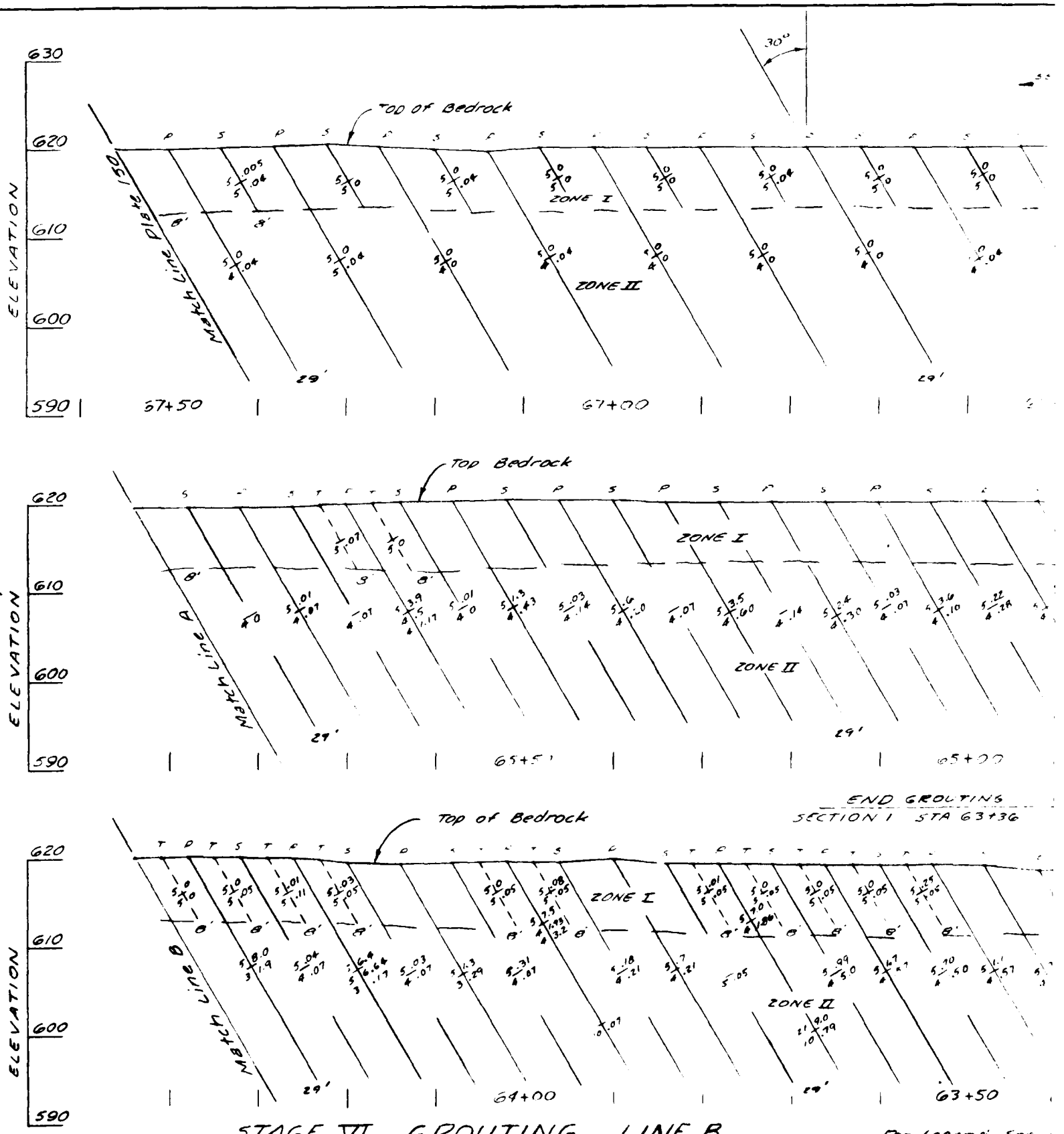
GROUTING LINE A
STA. 70+93 TO STA 72+55

Scale: AS SHOWN
Date: MARCH 1986
Sheet number
Dwg No
File No 0-12-9278

	Drill	Sacks	I	II
Primary	580'	54.61	0.59	54.02
Secondary	580'	14.58	0.36	14.22
Tertiary	145'	12.48	11.57	0.91



NG LINE A STA 70+93 TO STA 72+55



STAGE VI GROUTING LINE B

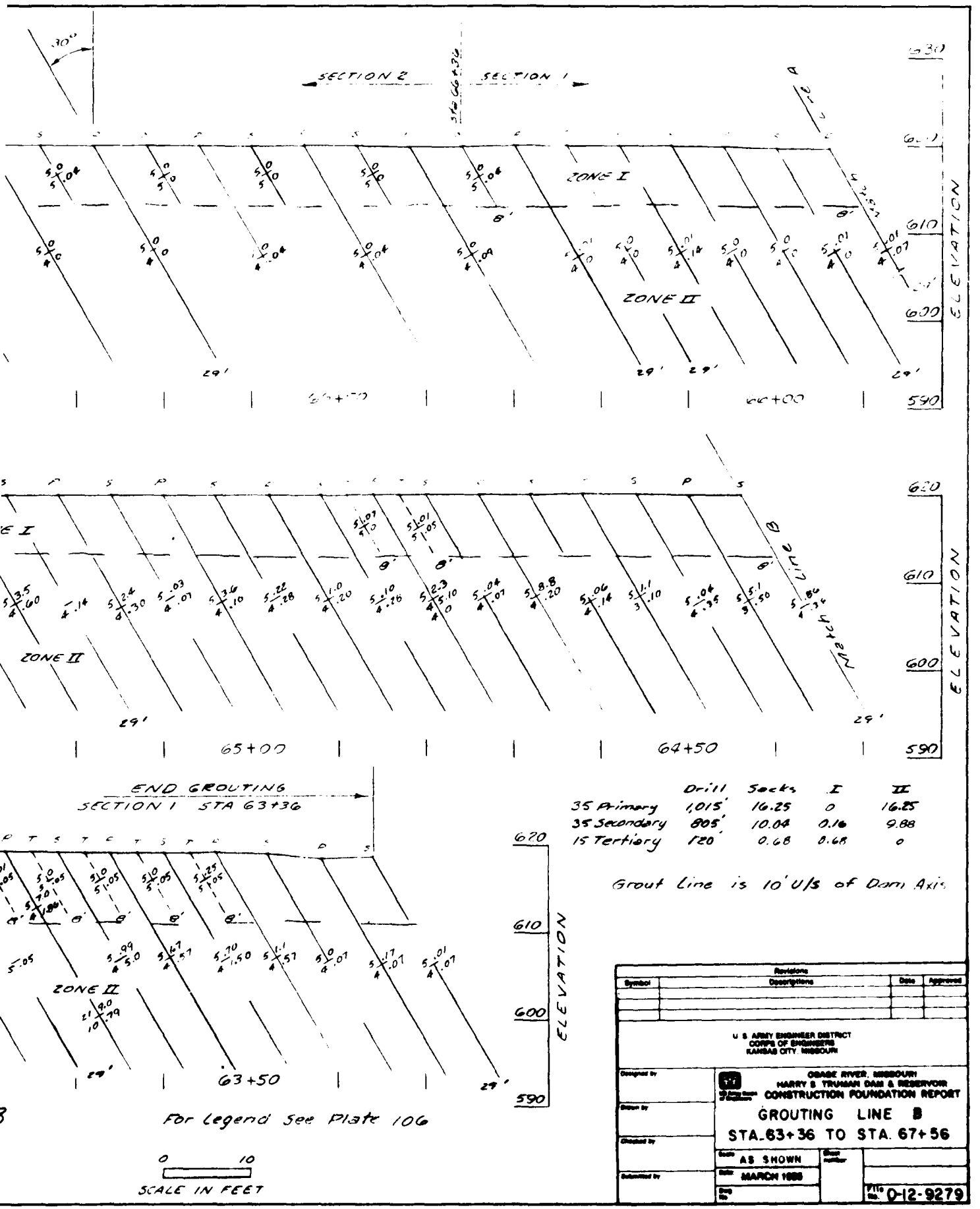
STA 63+36 TO STA 67+56

LOOKING DOWNSTREAM

For Legend See

0 10

SCALE IN FEET



	Drill	Sacks	I	II
35 Primary	1,015'	16.25	0	16.25
35 Secondary	805'	10.04	0.16	9.88
15 Tertiary	120'	0.68	0.68	0

Grout Line is 10' U/S of Dam Axis

Revisions			
Symbol	Descriptions	Date	Approved

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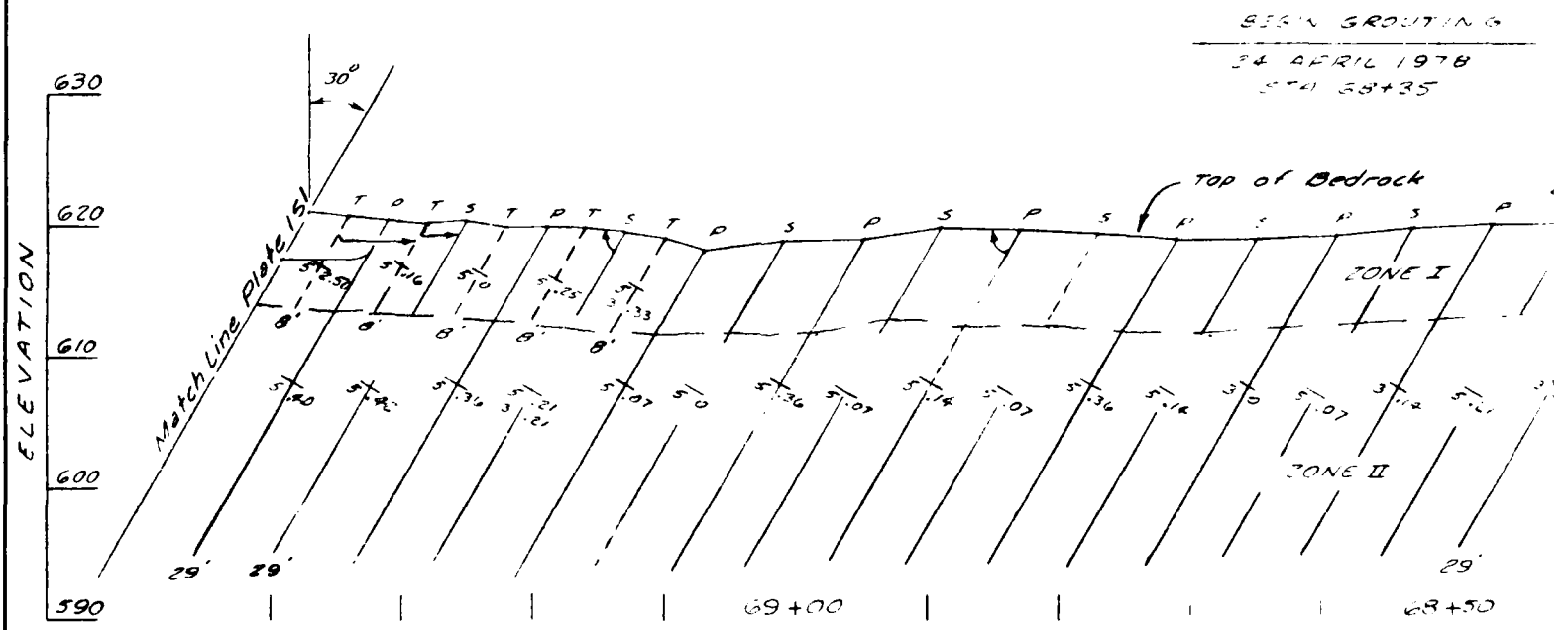
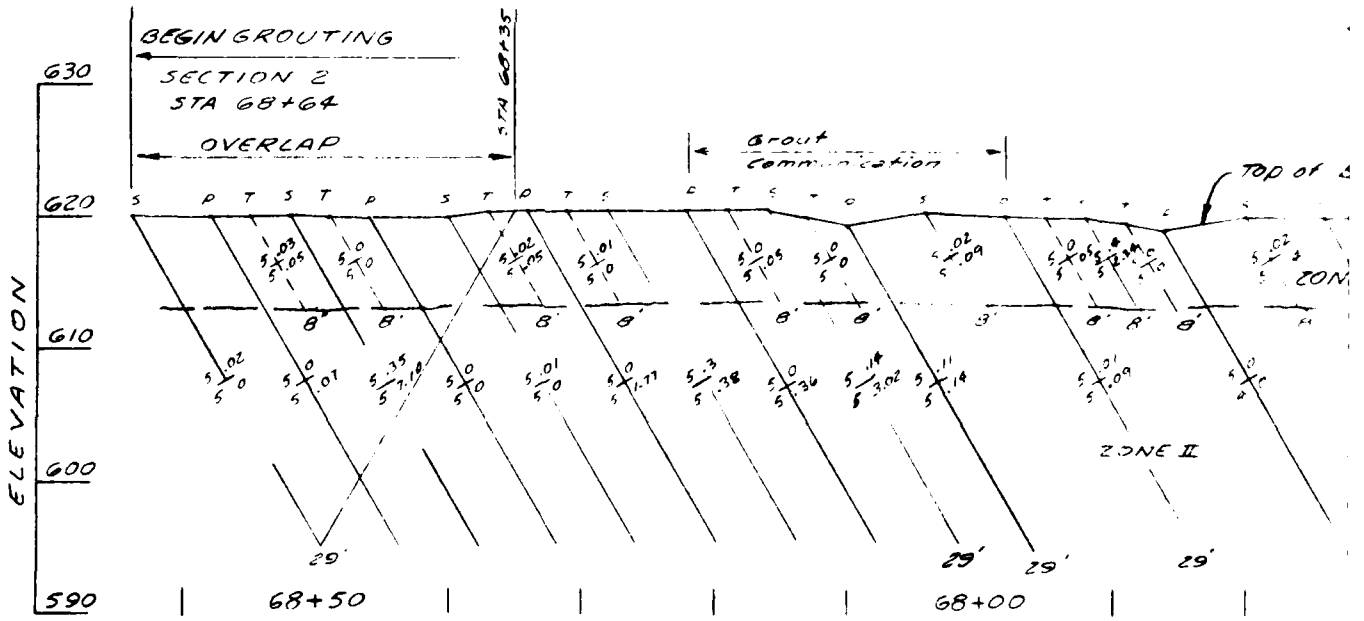
CONSTRUCTION FOUNDATION REPORT

GROUTING LINE B
STA. 63+36 TO STA. 67+56

Scale: AS SHOWN
Date: MARCH 1968
File No. 0-12-9279





STAGE VI GROUTING LINE B

STA 67+56 TO STA 69+37

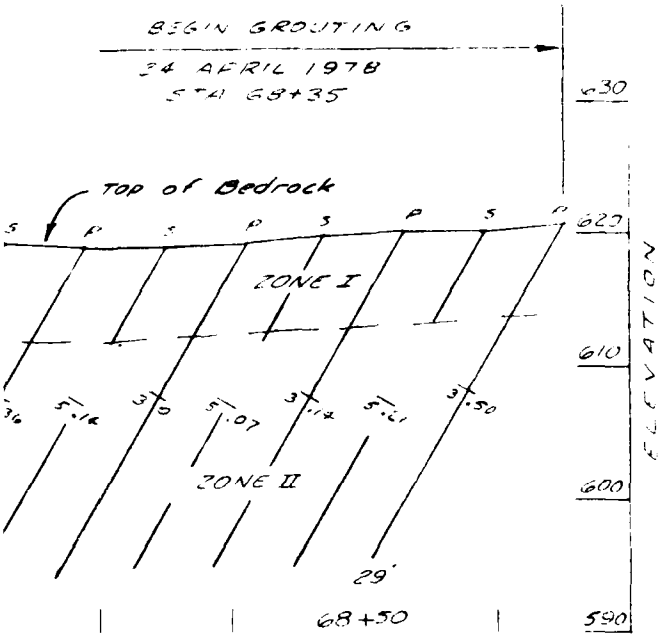
LOOKING DOWNSTREAM

Grout Line is in c/s at

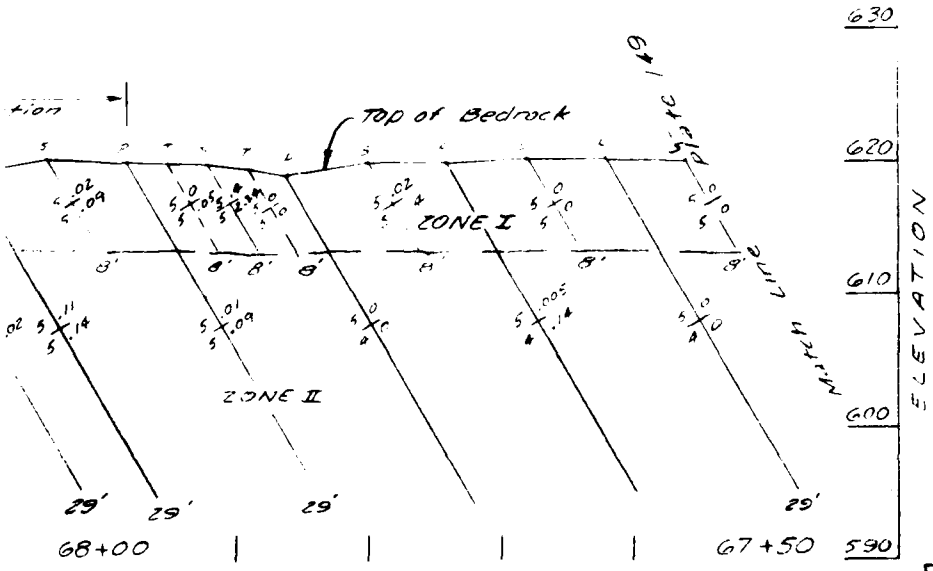
For Legend See Plate 106

0 10

SCALE IN FEET



	Drill	Sacks	I	II
18 Primary	522'	4.30	0	4.90
18 Secondary	417'	14.47	2.57	11.90
13 Tertiary	104'	3.44	3.44	0



B

Grout Line is 10' u/s of Dam Axis

Revisions			
Symbol	Descriptions	Date	Approved

U. S. ARMY ENGINEER DISTRICT
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KANSAS CITY, MISSOURI

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GROUTING LINE B
STA. 67+56 TO STA. 69+37

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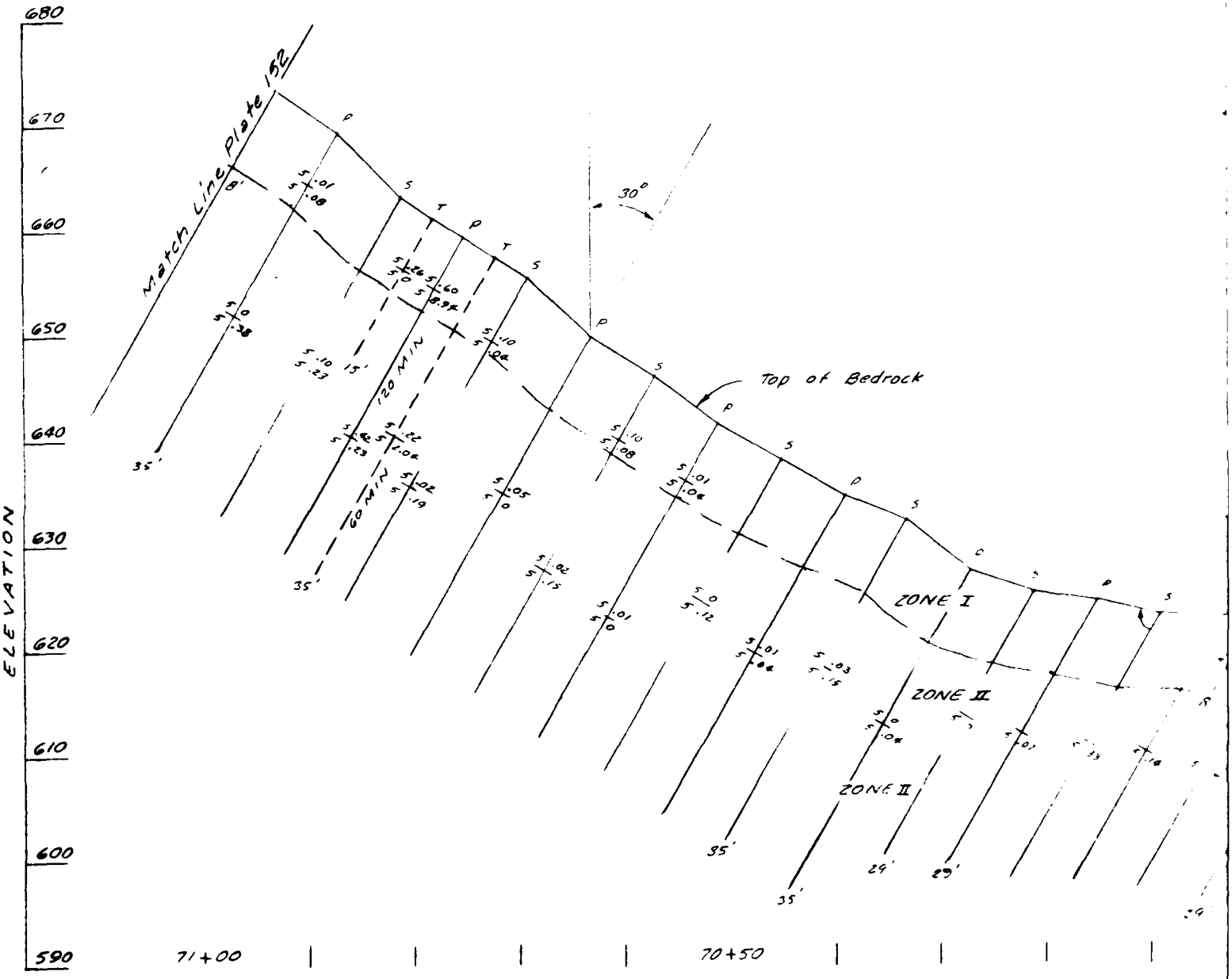
Scale: AS SHOWN
Date: MARCH 1986
File No. 0-12-9280

PLATE NO. 150



STAGE VI GROUTING LINE B

STA 69+37 TO STA 70+93

LOOKING DOWNSTREAM

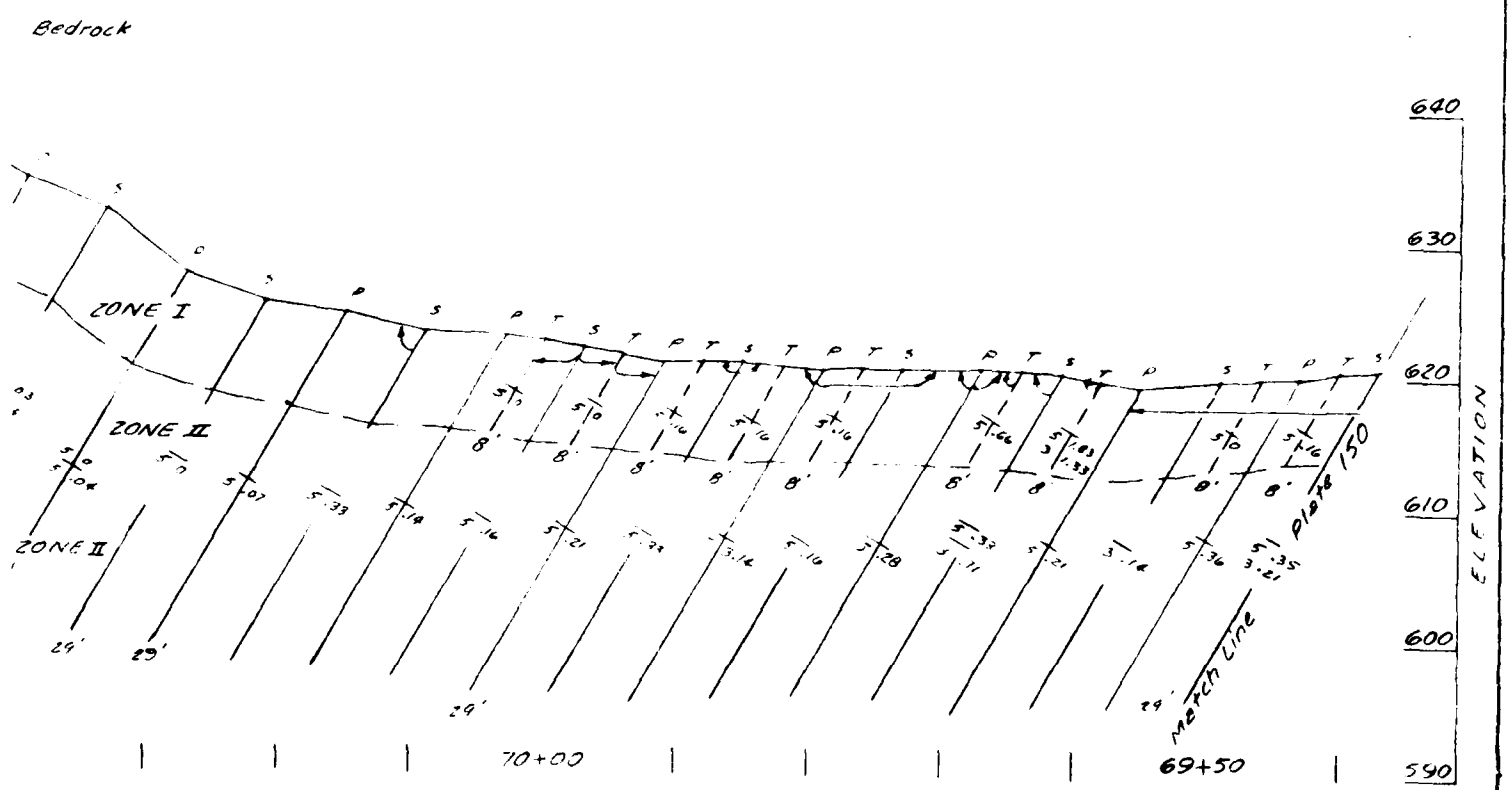
Grout Line is 10' U/S of Dam

For Legend See Plate 106

0 10

SCALE IN FEET

	Drill	Sack	I	II
13 Primary	413'	14.16	9.06	5.10
13 Secondary	2[illegible]7'	3.68	0.12	3.56
11 Tertiary	122'	6.44	4.40	2.04



9

· out Line is 10' U/S of Dam Axis

Revisions			
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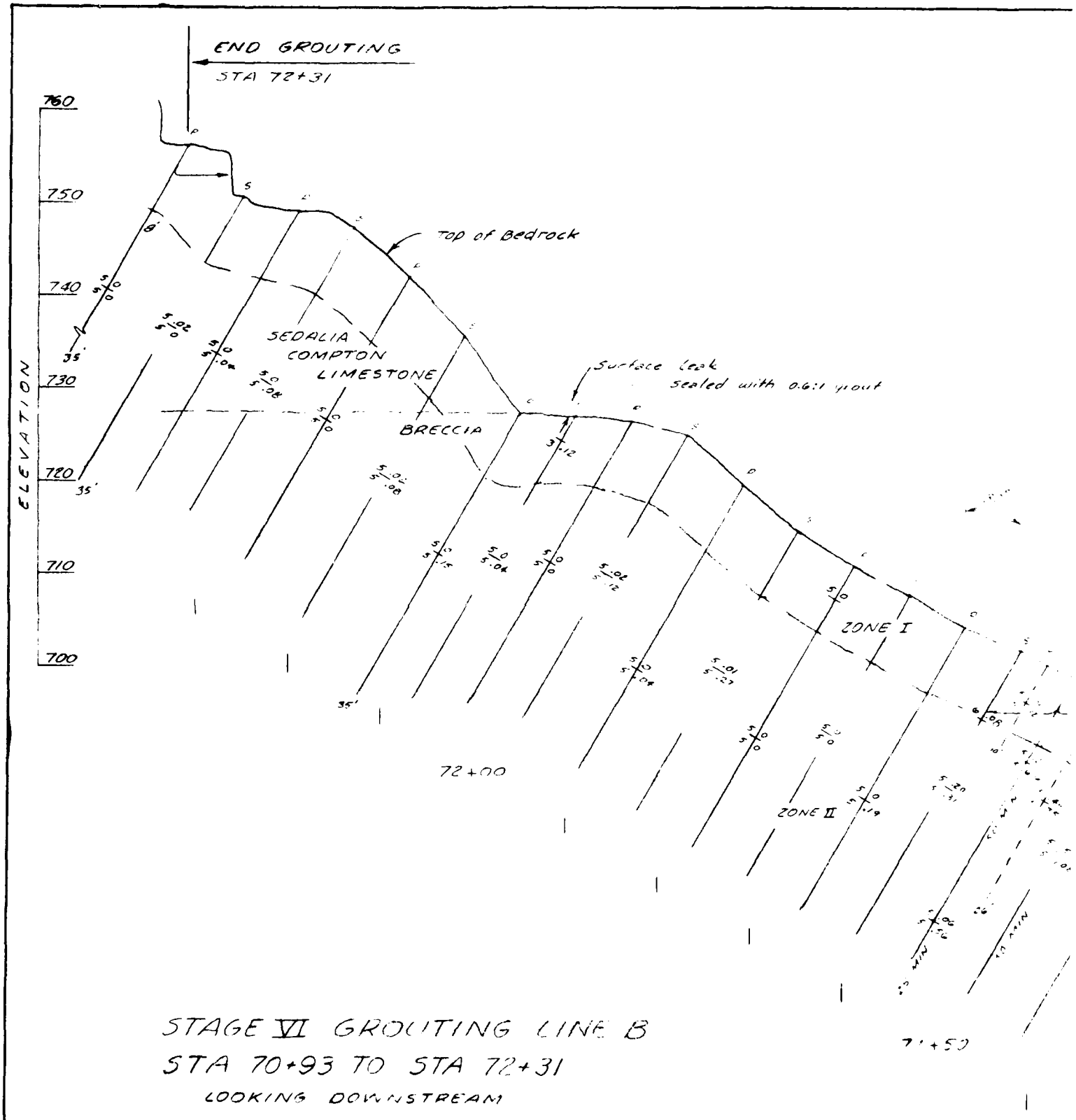
CONSTRUCTION FOUNDATION REPORT
GROUTING LINE B
STA. 69+37 TO STA. 70+93

Scale AS SHOWN
Date MARCH 1988
Sheet number
Drg. No.
File No. 0-12-9281

PLATE NO. 151



STAGE VI GROUTING LINE B
STA 70+93 TO STA 72+31
LOOKING DOWNSTREAM

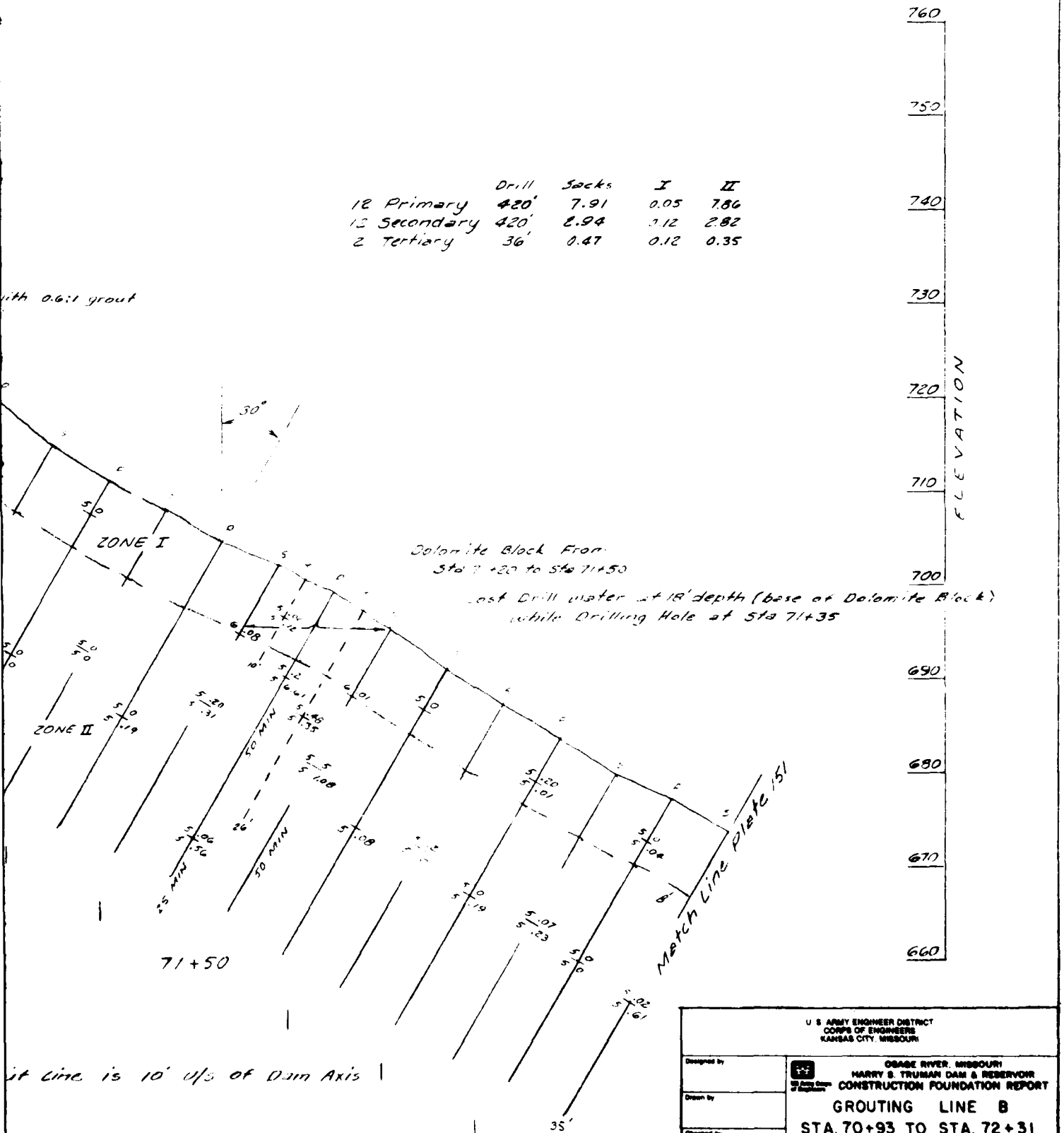
Grout line is 10' u/s of D.m. A

For Legend See Plate 106

0 10
SCALE IN FEET

Symbol	Revision Description

	Drill	Sacks	I	II
12 Primary	420'	7.91	0.05	7.86
12 Secondary	420'	2.94	0.12	2.82
2 Tertiary	36'	0.47	0.12	0.35



U S ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
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CONSTRUCTION FOUNDATION REPORT

GROUTING LINE B
STA. 70+93 TO STA. 72+31

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Scale: AS SHOWN
Date: MARCH 1966
File No. 0-12-9282

Revisions			
Symbol	Descriptions	Date	Approved

10
LE IN FEET

PLATE NO. 152

NUMBER TYPE OF HOLE AND LINEAL FT. DRILLED			SACKS OF CEMENT INJECTED AND PERCENT OF TOTAL			SACKS INJECTED PER 20' I	%	II	%
			STAGE I STA 22+38 TO STA 38+03 & STA 48+36 TO ST						
296	PRIMARY	14,480	88.06		59.98	25.30	28.73	29.33	33.31
260	SECONDARY	8,278	43.90		29.90	13.65	31.09	13.45	30.64
536	TERTIARY	6,067	14.85		10.12	8.45	56.90	3.35	22.56
1,092	TOTAL	28,825	146.81	10.82	100.00	47.40	32.29	46.13	31.42
			STAGE III SPILLWAY-POWERHOUSE STA 37+75 TO						
134	PRIMARY	9,581	357.19		60.50	259.96	72.78	62.26	17.42
89	SECONDARY	5,101	186.70		31.50	107.11	57.37	70.08	37.54
35	TERTIARY	1,674	47.94		8.00	29.73	62.02	5.25	31.81
1	QUATERNARY	71	0		0				
259	TOTAL	16,427	591.83	43.60	100.00	396.80	67.04	147.59	24.94
			STAGE VI LINE A 10' DOWNSTREAM STA 63+36 TO						
80	PRIMARY	2,234	71.92		42.07	0.59	0.76	77.33	99.24
80	SECONDARY	2,051	72.11		38.93	6.46	8.96	65.65	91.04
36	TERTIARY	411	35.20		19.00	34.29	97.41	0.91	2.59
196	TOTAL	4,696	185.23	13.65	100.00	41.34	22.32	143.89	77.68
			LINE B 10' UPSTREAM STA 63+36 T						
78	PRIMARY	2,370	43.22		50.62	9.11	21.08	34.11	78.92
78	SECONDARY	2,059	31.13		36.46	2.97	9.54	28.16	90.46
41	TERTIARY	382	11.03		12.92	8.64	78.33	2.39	21.67
197	TOTAL	4,811	85.38	6.29	100.00	20.72	24.27	64.66	75.63
			LINE C ℄ STA 63+39 TO STA 74+81						
104	PRIMARY	6,775	94.58		27.18	11.97	12.66	70.41	74.44
99	SECONDARY	3,968	132.09		37.95	5.64	4.27	125.95	95.35
156	TERTIARY	1,866	120.04		34.49	118.48	98.70	0.57	0.48
16	QUATERNARY	181	1.31		0.38	1.27	96.95	0.04	3.05
375	TOTAL	12,790	348.02	25.64	100.00	137.36	39.47	196.97	56.60
			TOTAL GROUT CURTAIN STA 22+38 TO STA 74+81						
692	PRIMARY	36,440	660.97		48.70	306.93	46.44	273.44	41.37
569	SECONDARY	21,457	465.93		34.33	135.83	29.15	303.29	65.10
804	TERTIARY	10,500	229.06		16.87	199.59	87.14	22.47	9.81
17	QUATERNARY	252	1.31		0.10	1.27	96.95	0.04	3.05
2,082	GRAND TOTALS	68,649	1,357.27	100.00	100.00	643.62	47.42	599.24	44.15

CURTAIN GROUTING SUMMARY

Does not include Sterett Creek Dike

CKS INJECTED PER ZONE AND PERCENT OF TOTAL							
I	%	II	%	III	%	IV	%
03 ℄ STA 48+36 TO STA 48+36 TO STA 63+96 ℄							
30	28.73	39.33	33.31	33.43	37.96		
.65	31.09	13.45	30.64	16.80	38.27		
.45	56.90	3.35	22.56	3.05	20.54		
40	32.29	46.13	31.42	53.28	36.29		
USE STA 37+75 TO STA 48+84							
9.96	72.78	62.26	17.42	34.97	9.80		
7.11	57.37	70.08	37.54	9.51	5.09		
9.73	62.02	5.25	31.81	2.96	6.17		
6.80	67.04	147.59	24.94	47.44	8.02		
TREAM STA 63+36 TO STA 72+55							
.59	0.76	77.33	99.24				
5.46	8.96	65.65	91.04				
4.29	97.41	0.91	2.59				
1.34	22.32	143.89	77.68				
STREAM STA 63+36 TO STA 72+31							
9.11	21.08	34.11	78.92				
2.97	9.54	28.16	90.46				
9.64	78.33	2.39	21.67				
0.72	24.27	64.66	75.63				
+39 TO STA 74+81							
1.97	12.66	70.41	74.44	12.12	12.82	0.08	0.08
5.64	4.27	125.95	95.35	0.50	0.38		
18.48	98.70	0.57	0.48	0.71	0.59	0.28	0.23
1.27	96.95	0.04	3.05	0			
17.36	39.47	196.97	56.60	13.33	3.83	0.36	0.10
22+38 TO STA 74+81							
96.93	46.44	273.44	41.37	80.52	12.18	0.08	0.01
35.83	29.15	303.29	65.10	26.81	5.75		
99.59	87.14	22.47	9.81	6.72	2.93	0.28	0.12
1.27	96.95	0.04	3.05				
43.62	47.42	599.24	44.15	114.15	8.41	0.36	0.02

MARY

Revisions			
Symbol	Descriptions	Date	Approved

U. S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

Designed by
Drawn by
Checked by
Submitted by

OSAGE RIVER, MISSOURI
HARRY S. TRUMAN DAM & RESERVOIR
CONSTRUCTION FOUNDATION REPORT

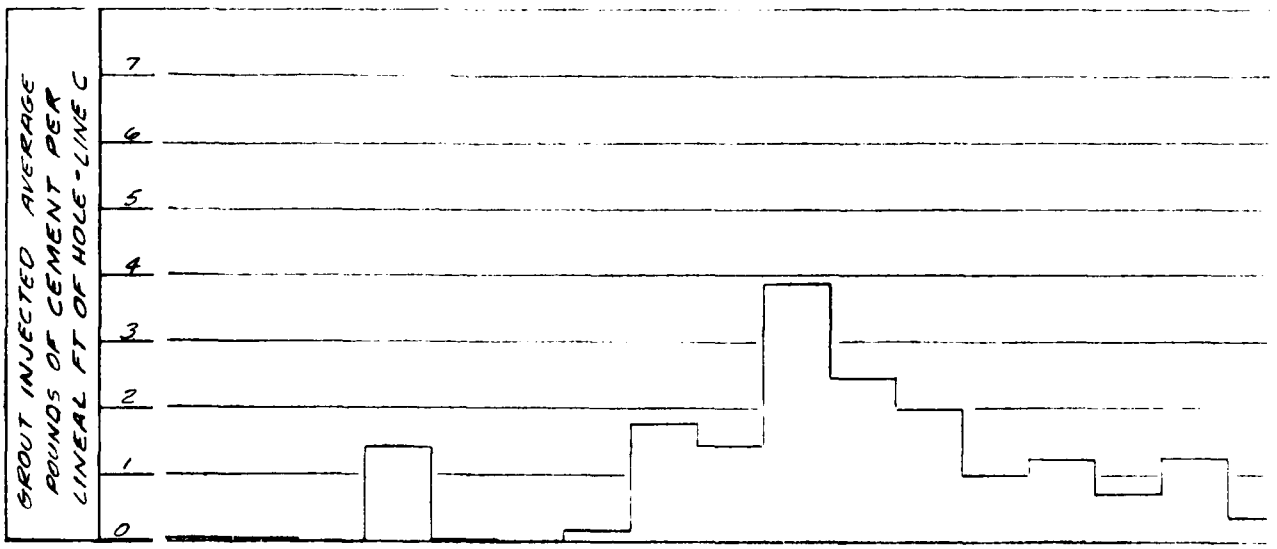
CURTAIN GROUTING SUMMARY

Scale: AS SHOWN
Date: MARCH 1966
Sheet number:
Dwg. No.
File No. 0-12-9283

PLATE NO. 153

GROUT INJECTED IN POUNDS OF CEMENT PER LINEAL FT OF HOLE

					SINK STRUCTURE STA 28+19 TO STA 28+52				MONOLITHS 1 THRU 4 RIGHT NON OVERFLOW	MONOLITH 5 ERECTION BAY	MONOLITHS 6,7 & 8 POWERHOUSE	MONOLITHS 9 THRU 13 SPILLWAY	MONOLITHS 14 THRU 18 LEFT NON OVERFLOW					
PRIMARY	P	0.02	0	0.01	.76	0	0	0.16	2.51	1.16	4.99 (2)	2.61	2.50	0.47	2.70	0.58	.50	0.4
SECONDARY	S	0	0.11	0	0.09	0.01	0	0.20	1.47	1.69	3.64	2.54	1.45	0.90	0.65	1.23	1.13	0.4
TERTIARY	T	0.11	0	0	1.62	0	0	0.12	1.30	0	2.90	2.07	0	1.50	0.29	0.28	0.15	0.2
QUATERNARY	Q																	
AVERAGE	A	0.043	0.037	0.003	1.423	0.003	0	0.160	1.760	1.425	3.843	2.423	1.975	0.975	1.213	0.697	1.26	0.3
		STAGE I							STAGE III					STAGE				
		22+38 to 24+32	24+55 to 26+24	26+27 to 27+77	27+80 to 30+74	30+77 to 32+75	32+78 to 34+97	35+00 to 38+00	38+37 to 39+96	39+96 to 40+68	40+68 to 44+00	44+00 to 46+10	46+10 to 48+01	48+36 to 50+04	50+04 to 51+48	51+51 to 53+01	53+04 to 54+48	54+51 to 56+52



(1) Does not include average of 2.12 pounds per lineal ft for 66 holes grouted from Sta 40+71.25 to Sta 43+96.25 drilled & grouted before placing placing concrete

(2) Thin open bedding planes or top 1.5'

(3) Osage River Channel Area

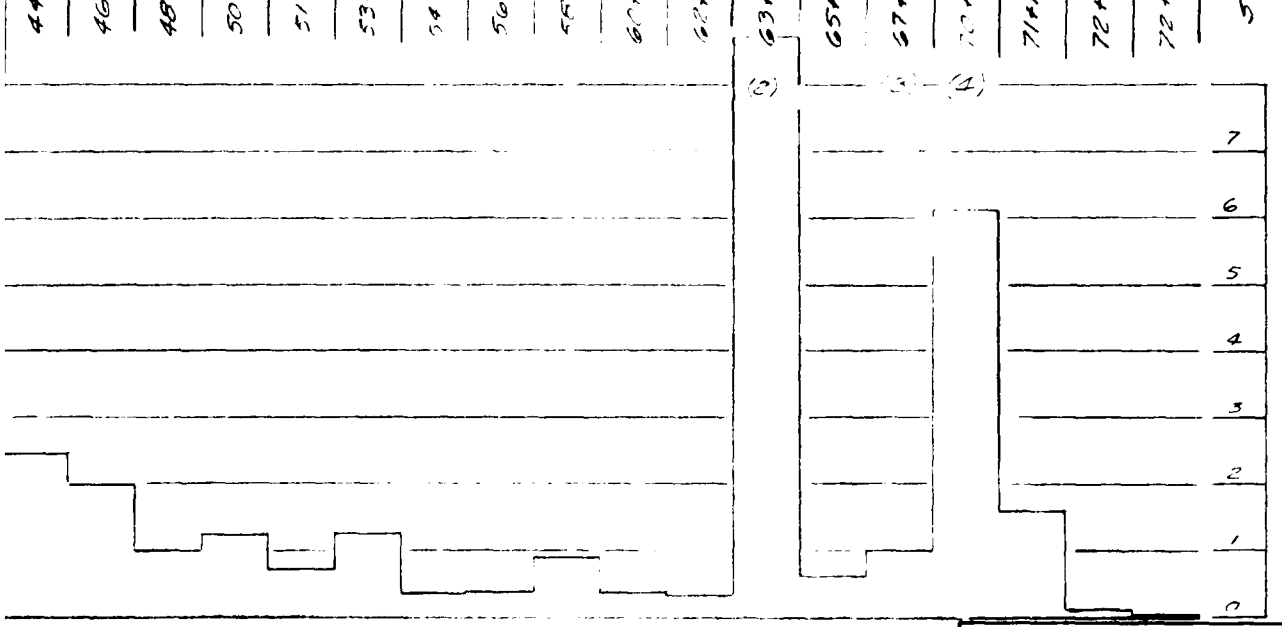
(4) Lo Sa

SUMMARY OF GROUT TAKES

For Stereft Creek Dike Grouting during Stage IV which is not include summary see Plates 154 & 155.

Station	Monoliths 9 thru 13 Spillway	Monoliths 14 thru 18 Left Non Overflow	Stage I									Stage VI						
44+00 to 46+10	2.61	2.50	0.47	2.70	0.58	2.50	0.41	0.52	0.64	0.60	0.46	2.32	0.28	0.59	10.50	2.27	0.16	0.30
46+10 to 48+01	2.59	1.45	0.90	0.65	1.23	1.13	0.47	0.39	1.35	0.14	[illegible]	12.26	0.14	0.98	8.45	1.46	0.09	0.07
48+36 to 50+04	2.07	0	1.50	0.29	0.28	0.15	0.26	0.28	0.59	0.30	0.33	19.11	1.43	1.11	5.15	0.60	0	0
50+04 to 51+48												1.09	0.58	0.33	0.30			
51+51 to 53+01	2.423	1.975	0.975	1.213	0.697	1.26	0.38	0.397	0.86	0.34	0.323	8.695	0.607	0.997	6.100	1.593	0.088	0.126
53+04 to 54+48																		
54+51 to 56+52																		
56+55 to 58+56																		
58+59 to 60+36																		
60+39 to 62+07																		
62+10 to 63+36																		
63+36 to 65+91																		
65+97 to 68+19																		
67+73 to 70+21																		
70+25 to 71+09																		
71+12 to 71+99																		
72+00 to 72+60																		
72+60 to 74+81																		

Station	Line A 10'D						Line B 10'U						Line C Dam Axis					
	P	1.59	0.89	0.85	1.63	16.10	0.08	P	3.03	0.49	2.09	4.43	2.34	0.04	2.32	0.28	0.59	10.50	2.27	0.16	0.30
	S	2.30	2.62	0.65	12.62	4.11	0.36	S	1.18	4.69	0.85	0.75	0.88	0.14	12.26	0.14	0.98	8.45	1.46	0.09	0.07
	T	0.42	0.54	2.65	46.77	0.61	0	T	0.53	0.29	6.63	3.84	1.23	0	19.11	1.43	1.11	5.15	0.60	0	0
	A	1.43	1.35	1.38	20.34	6.94	0.15	A	1.78	1.49	3.19	3.01	1.48	0.06	1.09	0.58	0.33	0.30			



en bedding planes
1.5'
River Channel Area

(4) Left Abutment shale & sandstone breccia

TAKES

which is not included in this

Revisions			
Symbol	Descriptions	Date	Approved

U. S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

Designed by
Drawn by
Checked by
Submitted by

OSAGE RIVER, MISSOURI
HARRY S. TRUMAN DAM & RESERVOIR
CONSTRUCTION FOUNDATION REPORT

SUMMARY OF GROUT TAKES

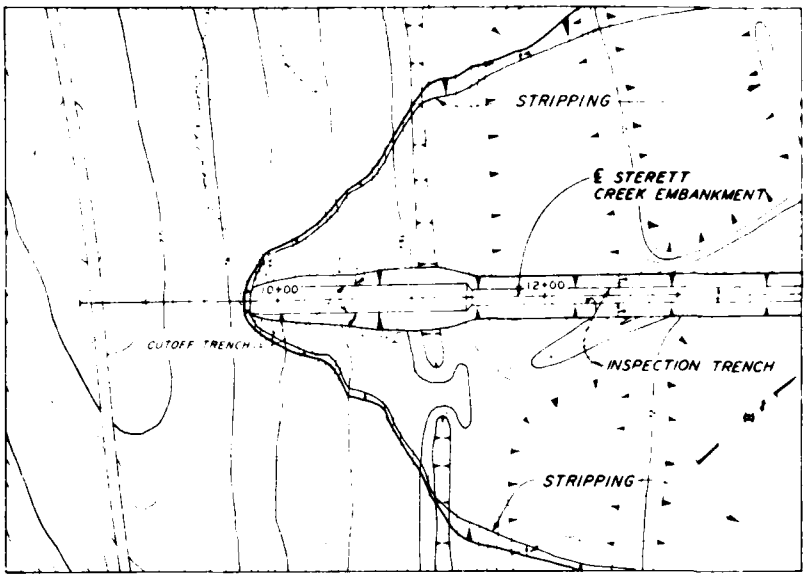
Scale: AS SHOWN
Date: MARCH 1966
File No. 0-12-9284

PLATE NO. 153-A

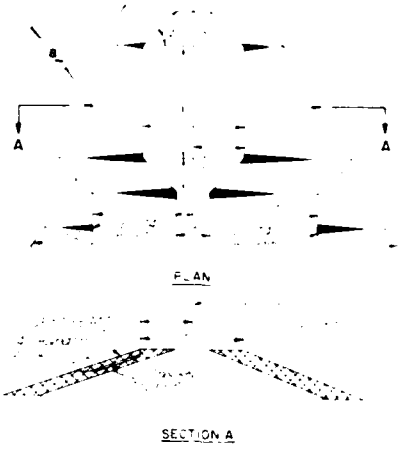
STAGE IV CONSTRUCTION

STRUCTION

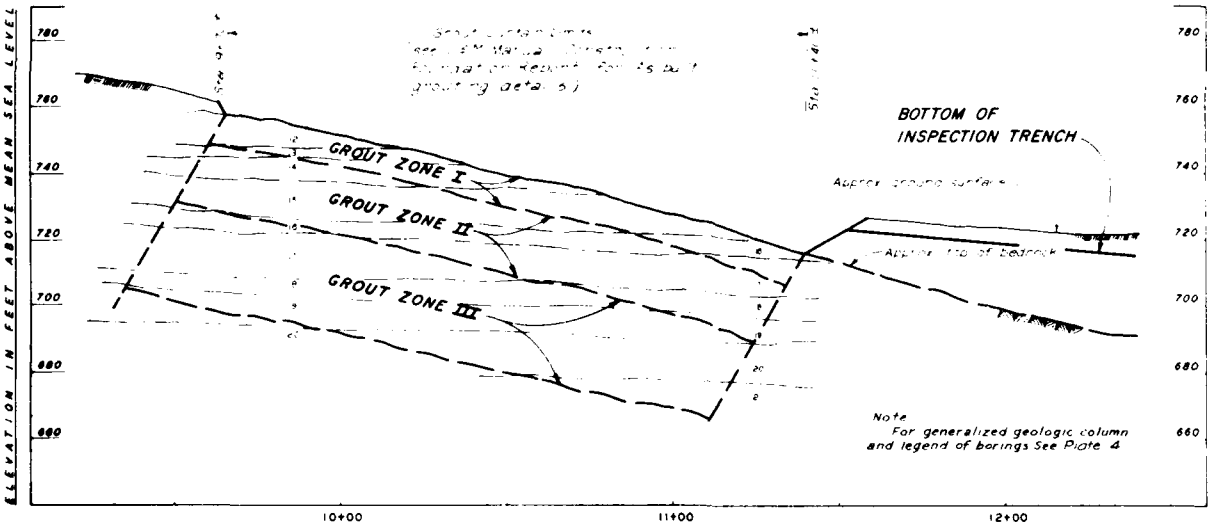
STAGE IV CONSTRUCTION



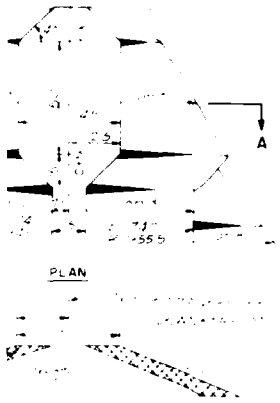
PLAN



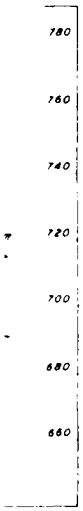
TURNAROUND DETAIL



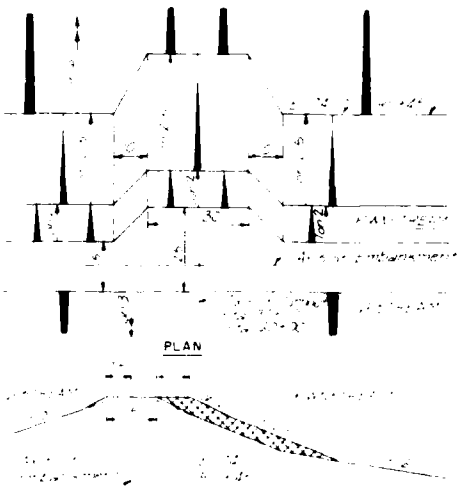
GROUT CURTAIN PROFILE



RNAROUND DETAIL



CUTOFF TRENCH DETAIL
EXCAVATION AND DENTAL TREATMENT



TURNOUT DETAIL

DRAWINGS IN THIS FOLIO
HAVE BEEN REDUCED TO ONE
HALF THE ORIGINAL SCALE

Revisions			
Symbol	Descriptions	Date	Approved

U S ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY MISSOURI

US Army Corps of Engineers

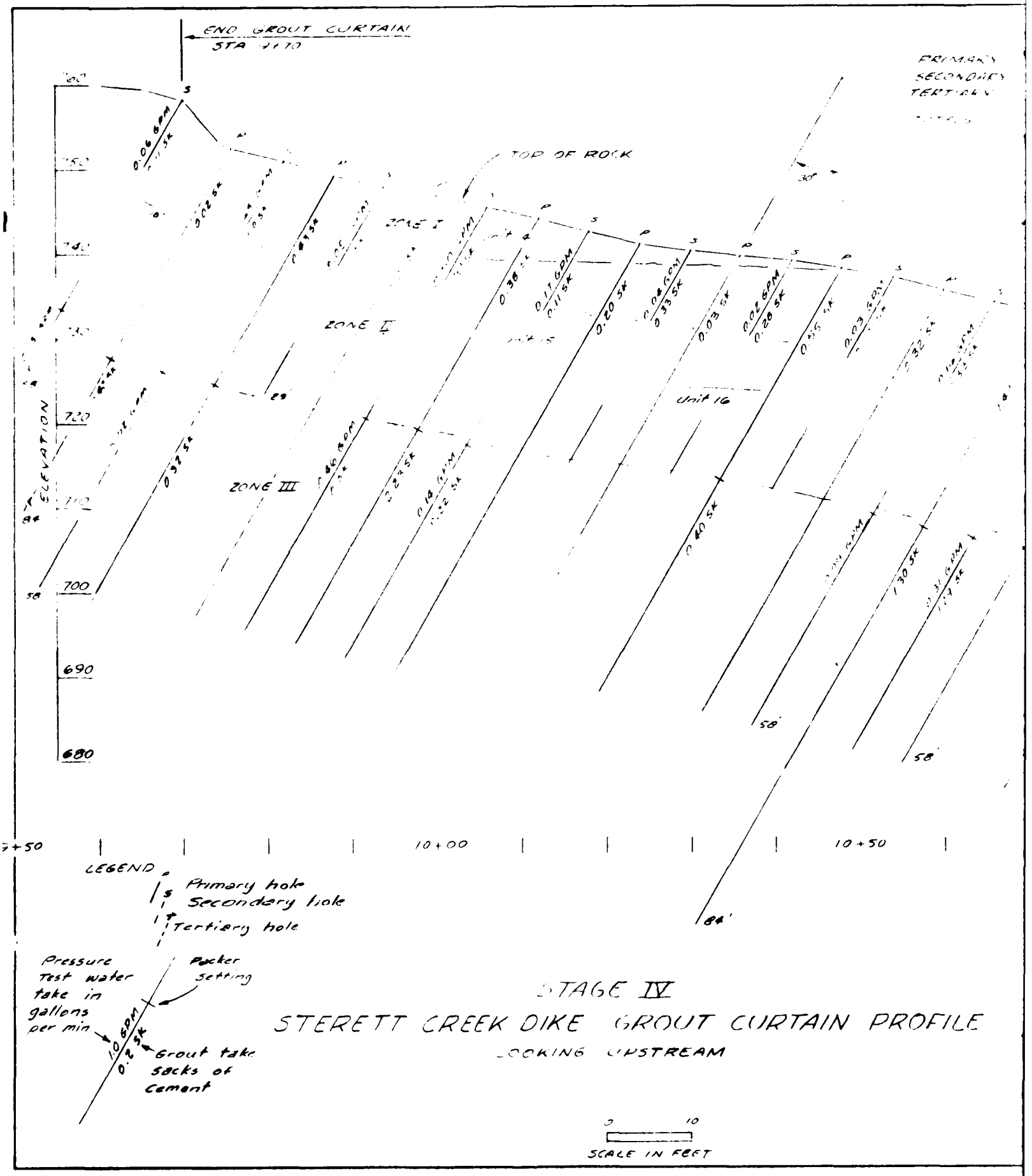
CONSTRUCTION FOUNDATION REPORT

RIGHT ABUTMENT GROUT CURTAIN
STERETT CREEK

Designed by
Drawn by
Checked by
Submitted by

Scale AS SHOWN
Date MARCH 1985
Dwg No
Sheet number
File No 0-12-9285

PLATE NO 154

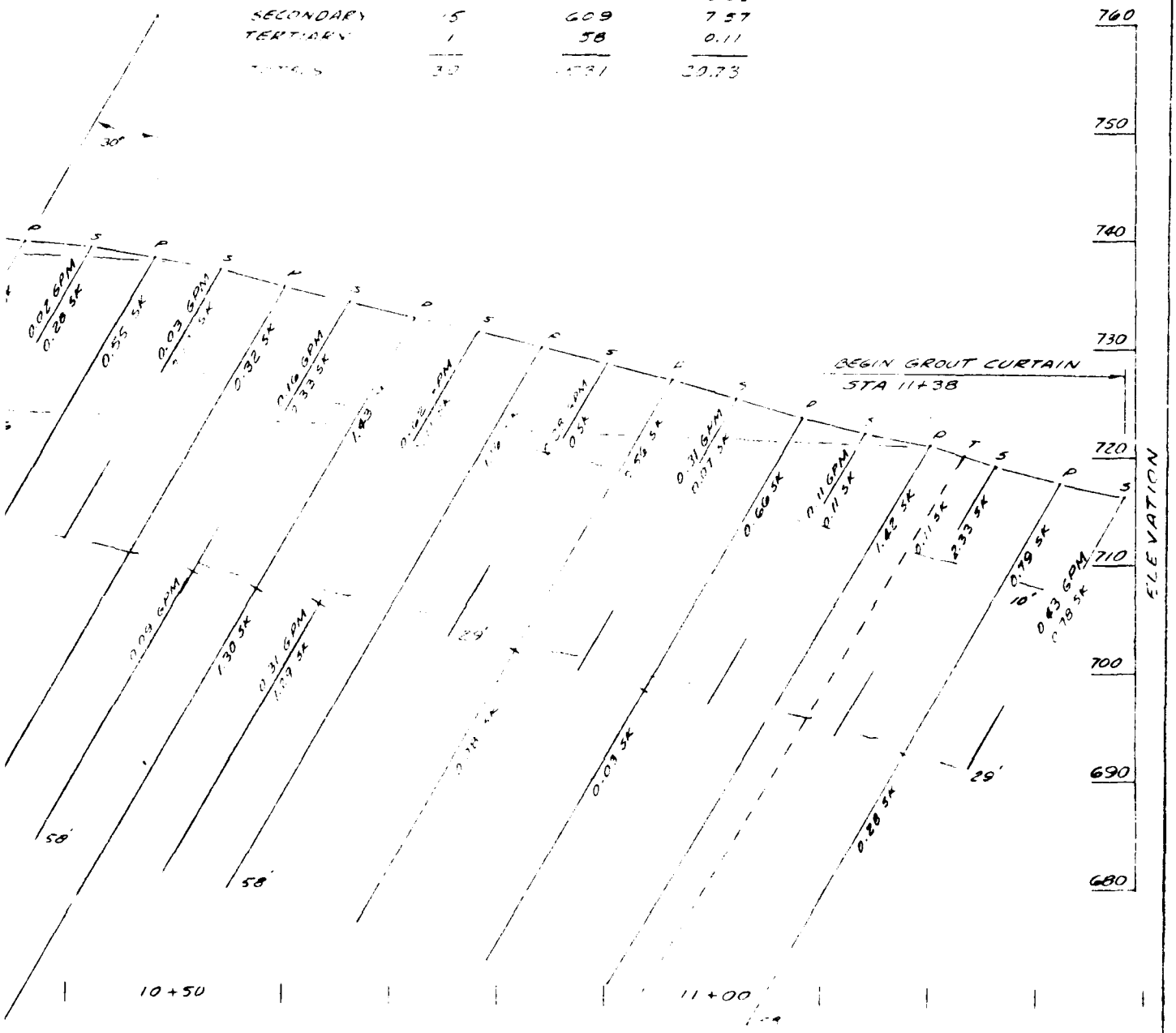


STAGE IV

STERETT CREEK DIKE GROUT CURTAIN PROFILE

LOOKING UPSTREAM

	NUMBER OF HOLES	LINEAL FEET	GROUT SACKS
PRIMARY	14	4[illegible]4	13.05
SECONDARY	15	609	7.57
TERTIARY	1	58	0.11
TOTALS	30	[illegible]731	20.73



Grout curtain on centerline

CURTAIN PROFILE

Revisions			
Symbol	Descriptions	Date	Approved

U S ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY MISSOURI

Designed by:
Drawn by:
Checked by:
Submitted by:

US Army Corps of Engineers

OSAGE RIVER, MISSOURI
HARRY S. TRUMAN DAM & RESERVOIR
CONSTRUCTION FOUNDATION REPORT

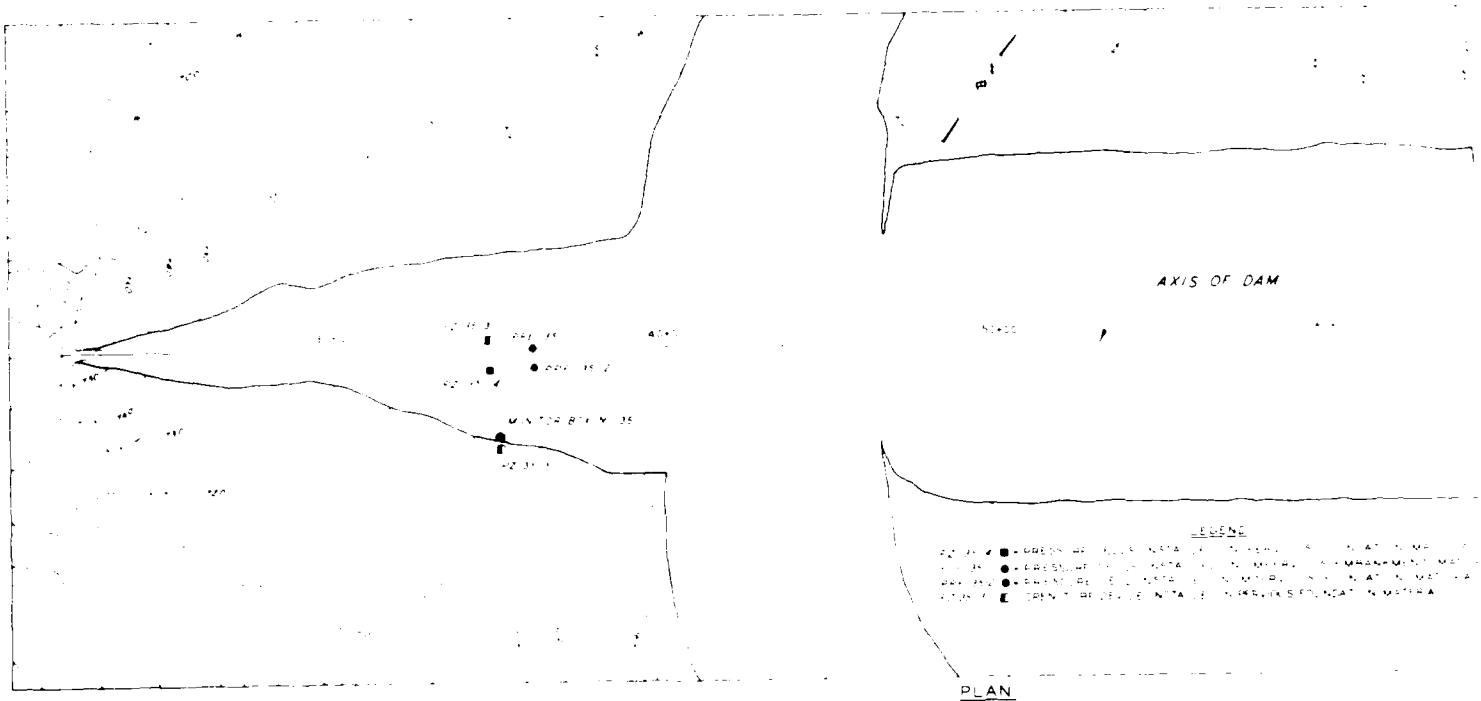
STERETT CREEK DIKE
GROUT CURTAIN PROFILE

Scale: AS SHOWN
Date: MARCH 1986
Sheet number:
Dwg No:
File No. 0-12-92 86

STAGE III CONSTRUCTION

TRUCTION

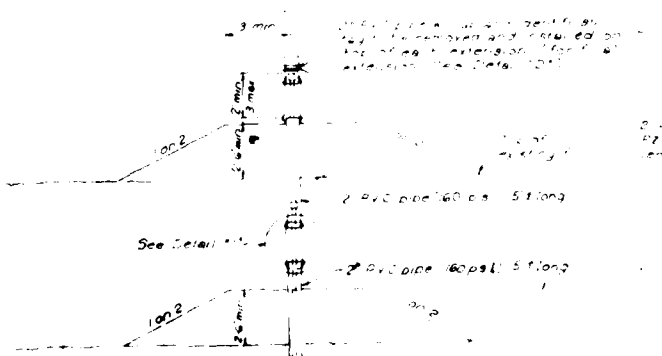
STAGE III CONSTRUCTION



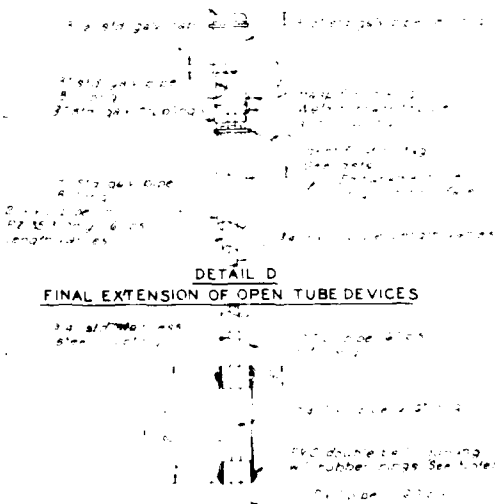
PLAN

STA 35+00

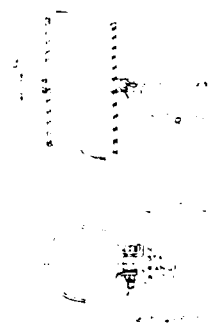
KAYSINGER BLUFF EMBANKMEN



DETAIL C
EXTENSION OF OPEN TUBE DEVICE PZ-35-3
Not to scale

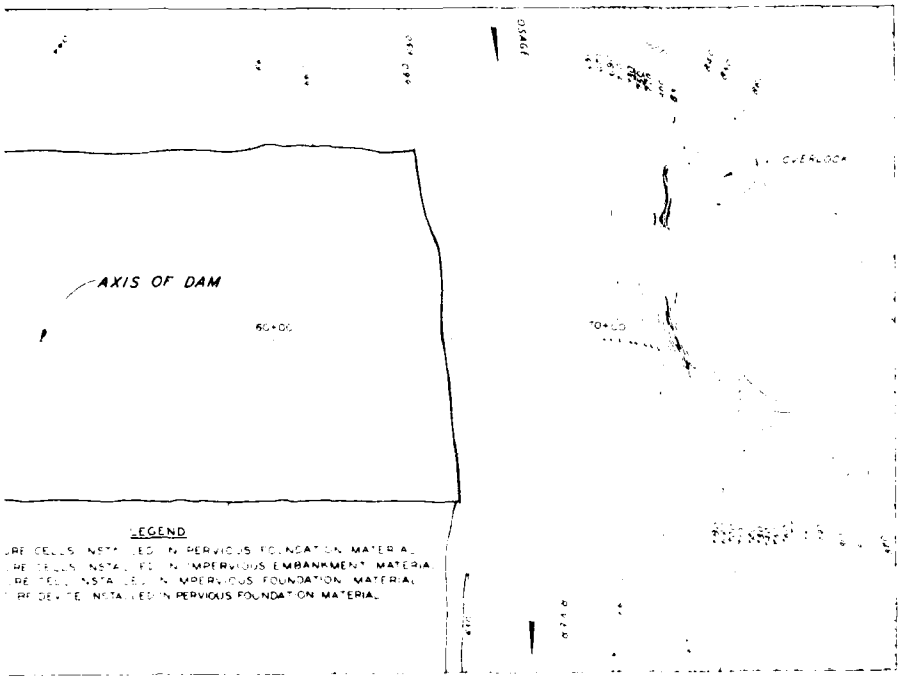


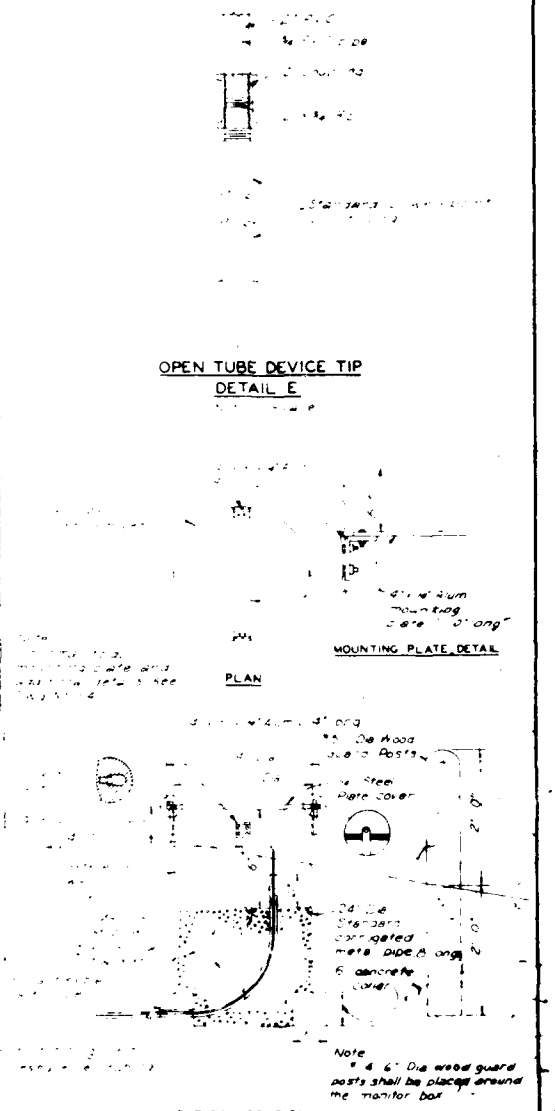
DETAIL D
FINAL EXTENSION OF OPEN TUBE DEVICES



IDENTIFICATION TAG DETAIL

DETAIL I
PROTECTIVE PIPE COUPLING
Not to scale





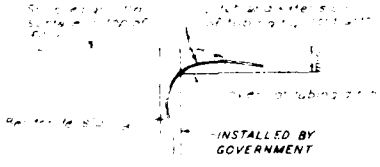
KAYSINGER BLUFF EMBANKMENT
OBSERVATION DEVICE SCHEDULE

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

SHEDULE OF
MONITOR BOX INSTALLATION

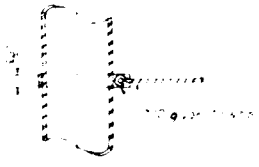
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

TYPICAL SECTION
EMBANKMENT MONITOR BOX
DETAIL B
Not to scale

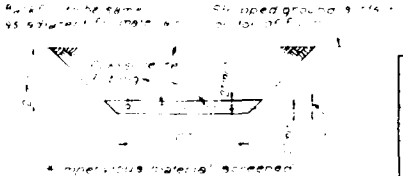


PROFILE

DRAWINGS IN THIS FOLIO
HAVE BEEN REDUCED TO ONE
HALF THE ORIGINAL SCALE



IDENTIFICATION TAG DETAIL



SECTION
TUBING DITCH DETAILS
DETAIL A
Not to scale

Symbol | Date | Approved

ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

US Army Corps of Engineers

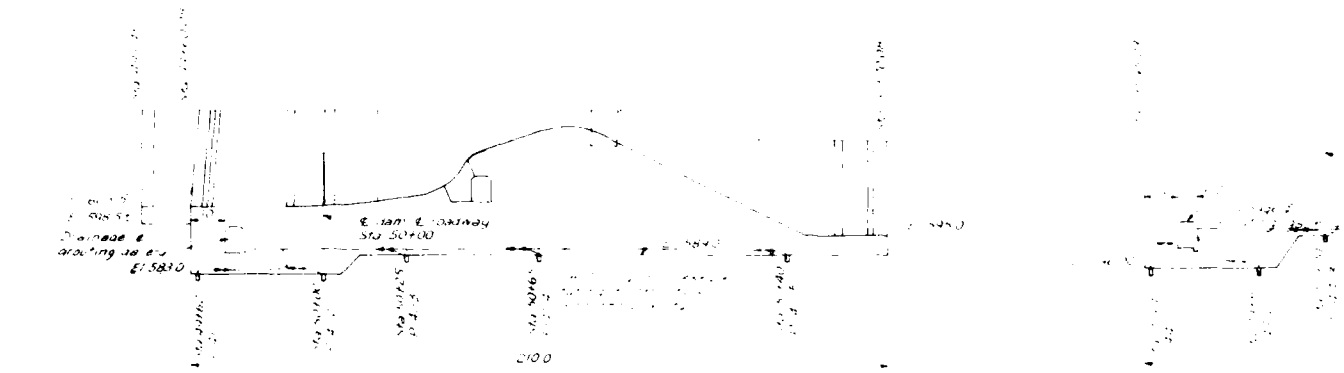
CONSTRUCTION FOUNDATION REPORT

OBSERVATION DEVICES
EMBANKMENT

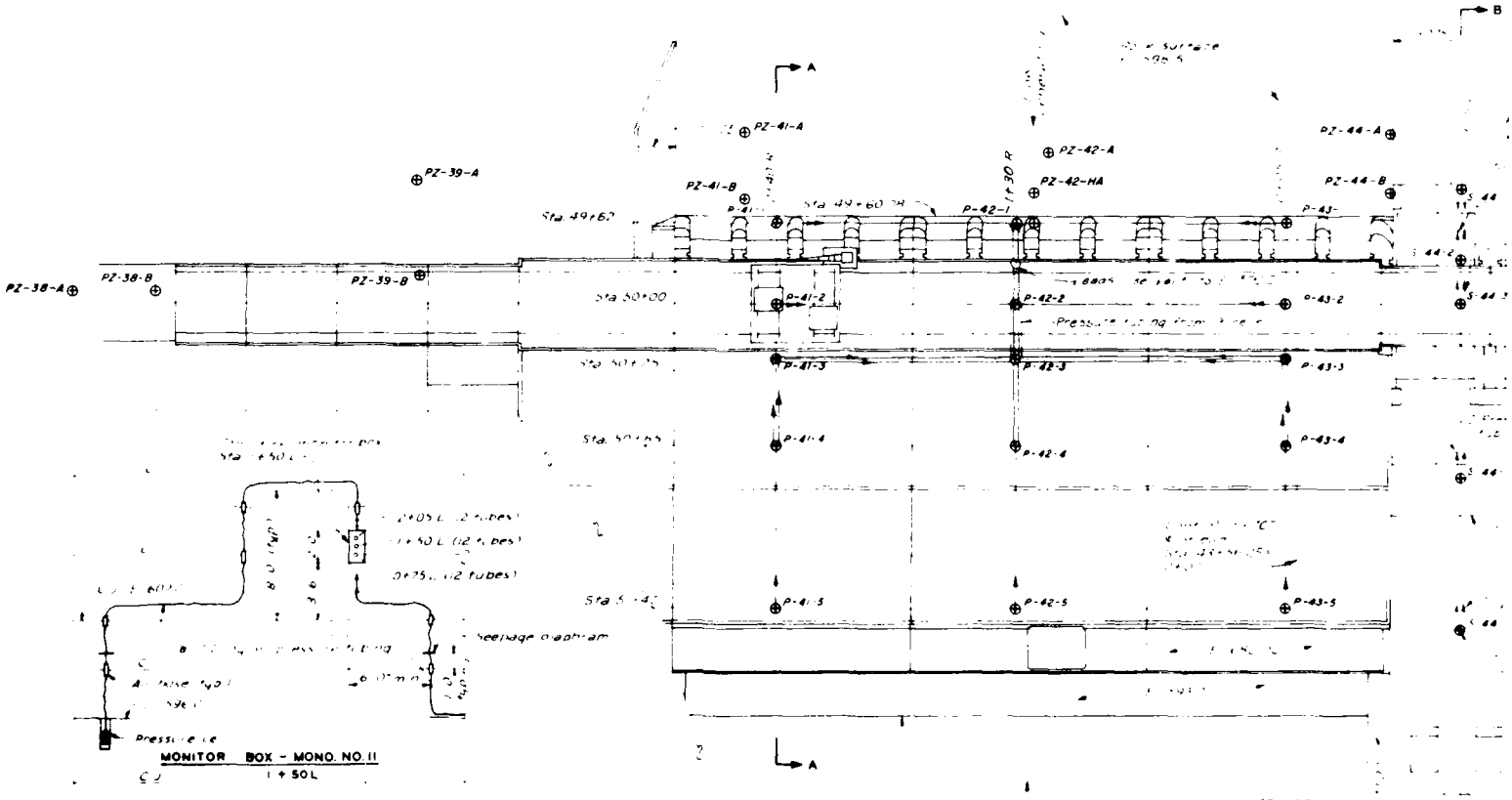
Sheet number

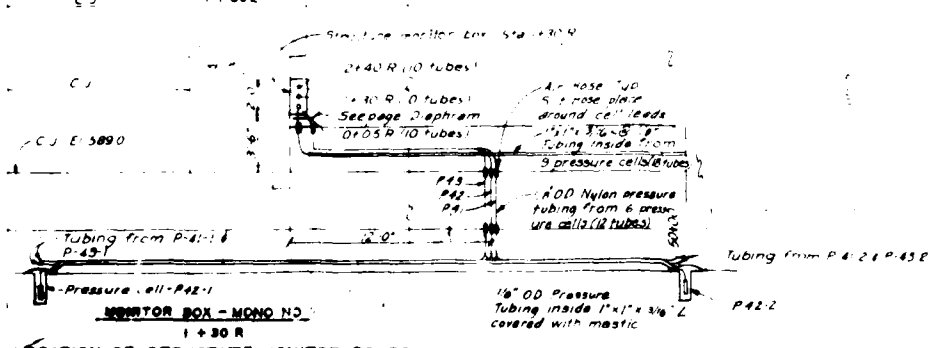
MARCH 1985

File No. 0-12-9287



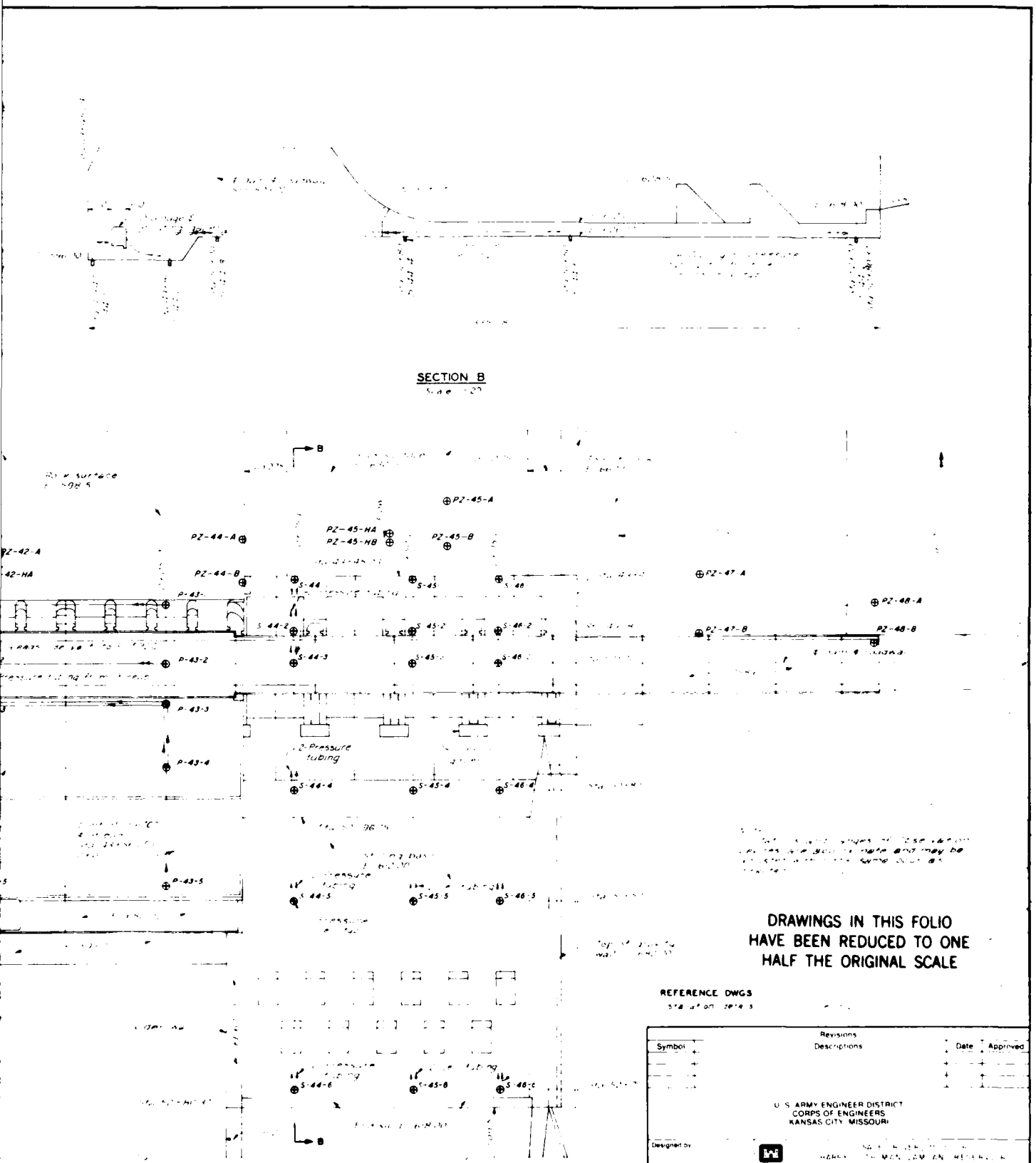
SECTION A





LOCATION OF STRUCTURE MONITOR BOXES

LOCATION PLAN
Scale 1" = 30'



DRAWINGS IN THIS FOLIO HAVE BEEN REDUCED TO ONE HALF THE ORIGINAL SCALE

REFERENCE DWGS

LOCATION PLAN
Scale 1" = 30'

Symbol	Revisions Descriptions	Date	Approved

U. S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

US Army Corps of Engineers

CONSTRUCTION FOUNDATION REPORT

OBSERVATION DEVICES
SPILLWAY - POWERHOUSE

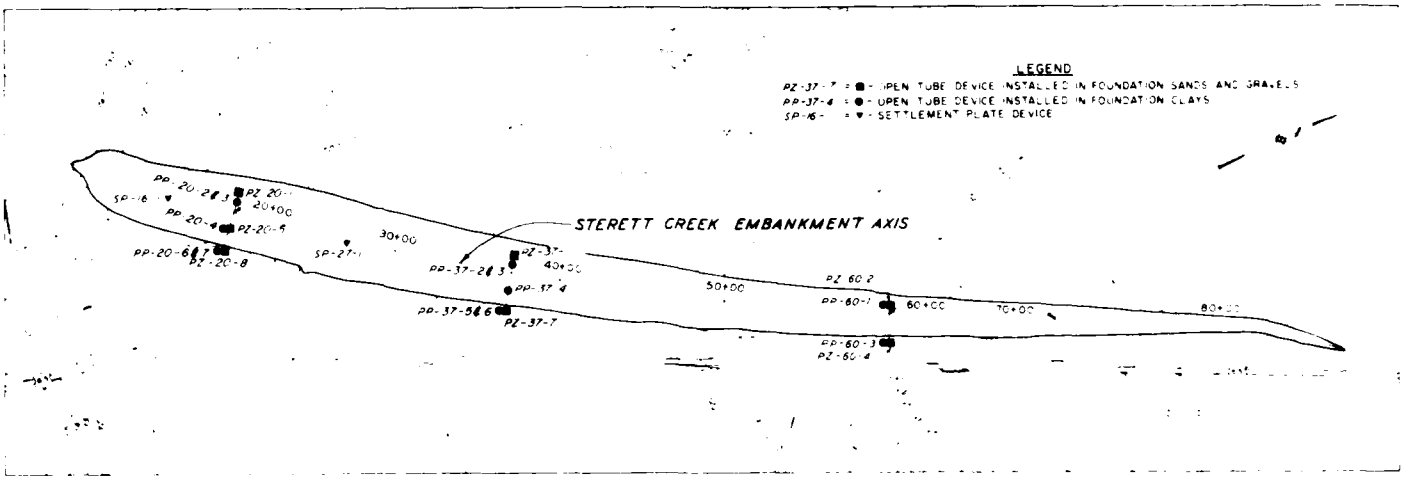
Designed by
Drawn by
Checked by
Submitted by

Scale AS SHOWN
Date MARCH 1985
Dwg No
Sheet number
File No. 0-12-9288

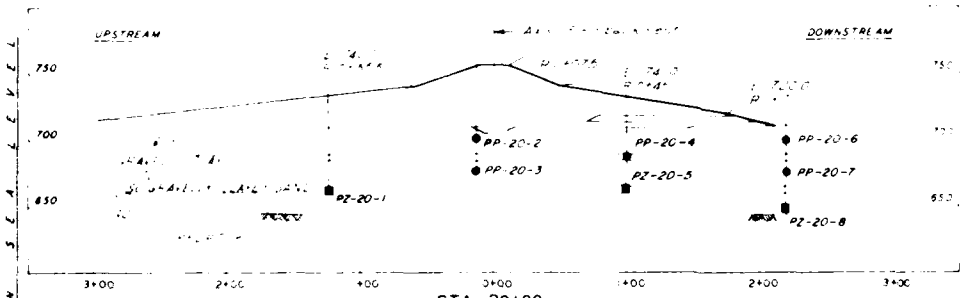
STAGE IV CONSTRUCTION

NSTRUCTION

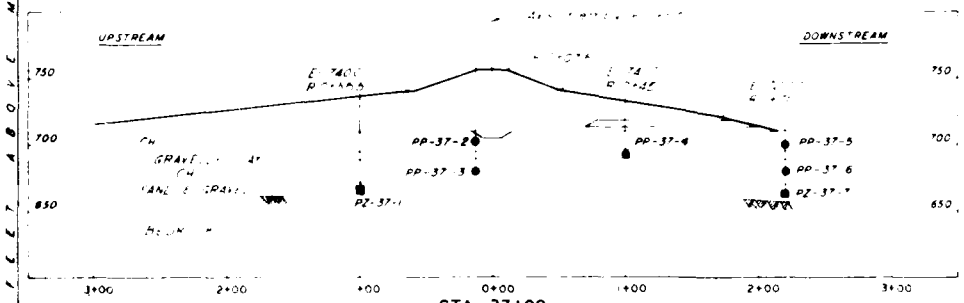
STAGE IV CONSTRUCTION



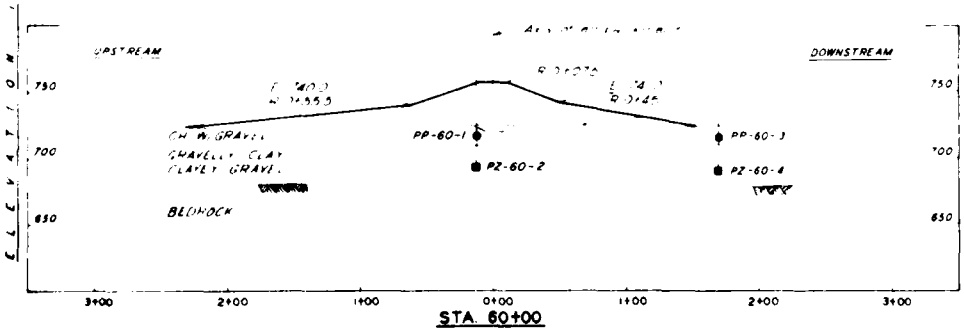
PLAN



STA. 20+00



STA. 37+00

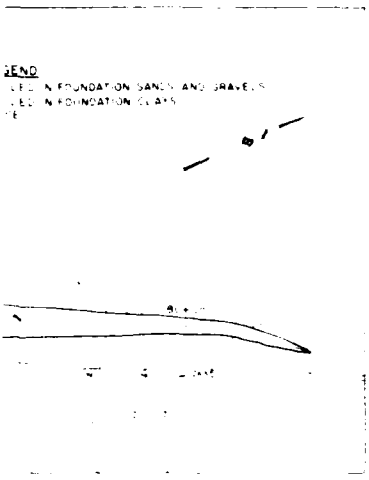


STA. 60+00

ELEVATION IN FEET ABOVE MEAN SEA LEVEL

STERETT CREEK EMBANKMENT
SCHEMATIC OF REST
SETTLEMENT MONUMENTS

DRAWINGS IN THI
HAVE BEEN REDUCE
HALF THE ORIGINA



STERETT CREEK EMBANKMENT

SCHEDULE OF OBSERVATION DEVICES

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

STERETT CREEK EMBANKMENT

SCHEDULE OF REFERENCE SETTLEMENT MONUMENTS

[illegible]

DRAWINGS IN THIS FOLIO HAVE BEEN REDUCED TO ONE HALF THE ORIGINAL SCALE

Symbol	Revisions Descriptions	Date	Approved

U. S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

Designed by

Drawn by

Checked by

Submitted by

US Army Corps of Engineers

[illegible]

CONSTRUCTION FOUNDATION REPORT

OBSERVATION DEVICES
STERETT CREEK

Scale: AS SHOWN

Date: MARCH 1985

Sheet number

Dwg No.

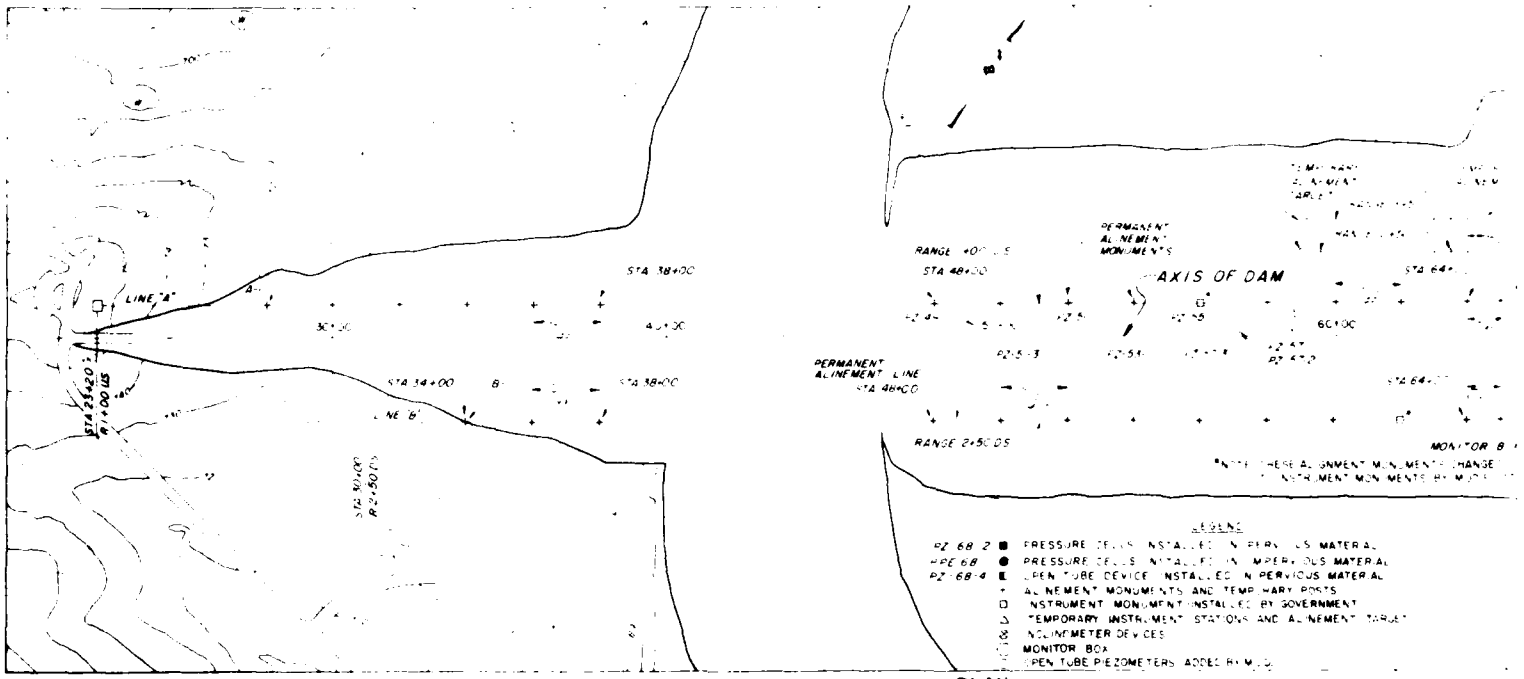
File No. 0-12-9289

PLATE NO. 158

STAGE VI CONSTRUCTION

TRUCTION

STAGE VI CONSTRUCTION



SCHEDULE OF MONITOR BOX INSTALLATION

BOX NO	STATION	RANGE	ELEV TOP OF BOX
68-A	68+00	4+00 D	[illegible]
68-B	68+00	0+70 U	74

CREST SETTLEMENT MONUMENTS

NUMBER	STATION	RANGE	ORIGINAL TOP ELEV
SM-1	28+00	0+16.50	755.46
SM-2	39+00	0+16.50	755.9
SM-3	39+00	0+16.50	758.30
SM-4	49+00	0+16.50	758.21
SM-5	54+00	0+16.50	755.99
SM-6	59+00	0+16.50	755.95
SM-7	64+00	0+16.50	756.04
SM-8	69+00	0+16.50	755.39

Note: Original top elevation determined by government

MAIN EMBANKMENT
OPEN TUBE PIEZOMETER

DEVICE NO	STATION	RANGE	TIP ELEVATION	MATERIAL
PZ 49-1	49+50	0+30 US	631	Foundation Gravels
PZ-51-1	51+50	0+20 US	615	Limestone
PZ-51-3	51+50	0+30 DS	615	Limestone
PZ 53-1	53+00	0+30 DS	645	Foundation Gravels
PZ 55-1	55+00	0+20 US	649	Impervious Embankment
PZ-57-1*	57+00	0+20 US	591	Limestone
PZ-57-2*	57+00	0+20 US	622	Foundation Gravels
PZ-57-3	57+00	0+30 DS	595	Limestone

*Installed in same protective pipe

Open tube piezometers with PVC extension pipe and protective pipe were furnished and installed by government through the existing embankment to elev 75[illegible]. The Contractor extended (under contract modification) Piezometers to the final dam elevation of 756.

MAIN EMBANKMENT
PIEZOMETER DEVICE SCHEDULE

DEVICE NO	STATION	RANGE	TIP ELEVATION	MATERIAL
PZ 66	66+[illegible]	[illegible]	[illegible]	Pervious to Impervious
PPE-68-1	68+00	[illegible]	[illegible]	Impervious Embankment
PZ-68-2	68+00	0+50 D	635*	Pervious Foundation
PPE-68-3	66+00	0+75 D	635*	Pervious to Impervious
PZ-68-4	68+00	4+00 D	635*	Pervious Foundation
PZ-68-5	68+00	4+50 D	625*	Pervious Foundation
PPE-68-6	68+00	3+50 D	66[illegible]	Impervious Embankment
PZ-68-7	68+00	3+10 D	625*	Pervious Foundation
PZ-68-8	68+00	0+70 D	635*	Pervious Foundation
PPE-68-9	68+00	0+30 D	[illegible]*	Impervious Embankment
PZ-68-[illegible]	68+00	1+80 D	[illegible]*	Pervious Foundation

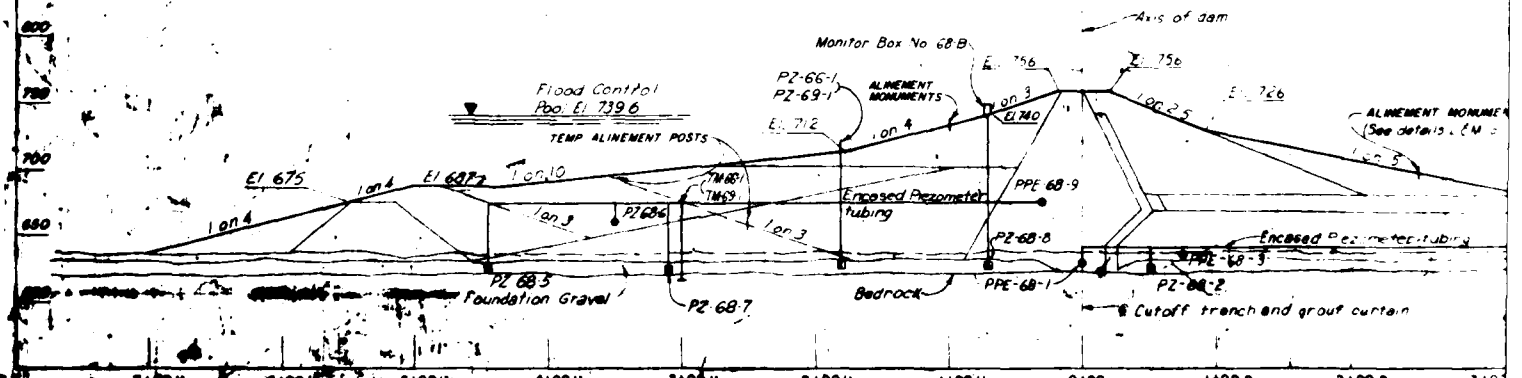
Pressure cells to be furnished by government and installed by government. Piezometers to be furnished by government and extended by contractor.

Open tube piezometers

(1) PZ 66-1, PZ-68-4, PZ-68-5 and PZ-68-7 to be installed in the foundation gravels by government and extended above the grade by contractor

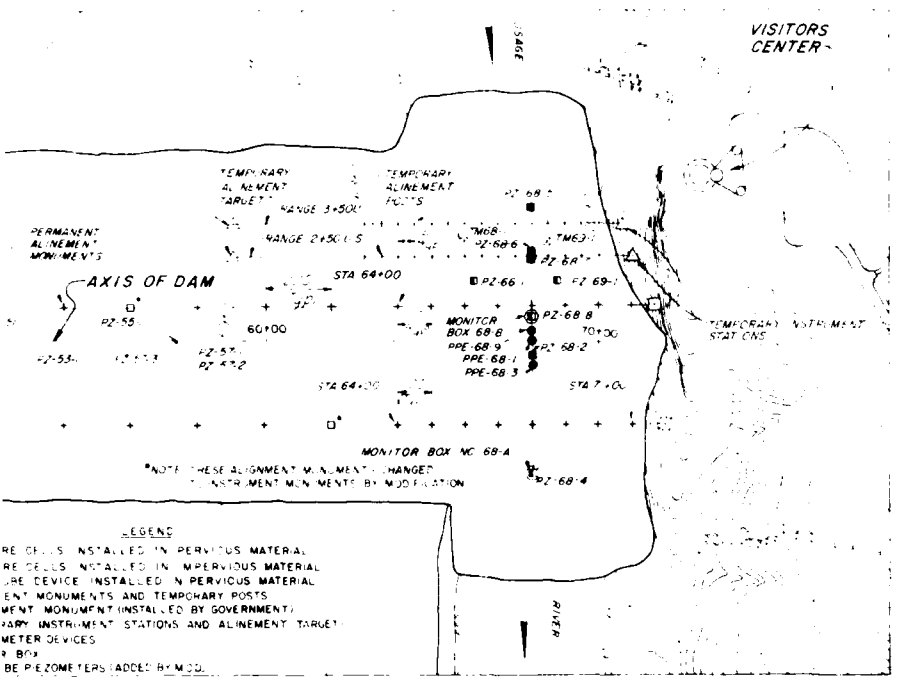
(2) For details see this sheet and Dwg No 52

(A)



(A) STA. 68+00

DRAWINGS IN THIS FOLIO HAVE BEEN REDUCED TO ONE HALF THE ORIGINAL SCALE



TEMPORARY ALINEMENT POST DETAIL

TEMPORARY INSTRUMENT STATION DETAIL

MAIN EMBANKMENT
PIEZOMETER DEVICE SCHEDULE

STATION	RANGE	TOP ELEVATION	MATERIAL	TYPE INSTALLATION
[illegible]	[illegible]	[illegible]	Pervious Foundation	A-E-G
68+00	[illegible]	[illegible]	Impervious Embankment	B-
68+00	0+50 D	625'	Pervious Foundation	B-
66+00	0+75 D	635'	Impervious Embankment	[illegible]
62+00	4+00 D	625'	Pervious Foundation	[illegible]
68+00	4+50 U	625'	Pervious Foundation	B-
68+00	3+50 U	660'	Impervious Embankment	B-U
[illegible]	3+10 U	625'	Pervious Foundation	B-U
63+00	0+70 U	625'	Pervious Foundation	C-F-G-H-O
68+00	2+30 U	675'	Impervious Embankment	B-
68+00	1+80 U	625'	Pervious Foundation	A-E-G-C

[illegible] to be furnished by government
[illegible] installed by government. Tubing to be [illegible] by government and extended by [illegible] contractor.
[illegible] tube piezometers
PZ 66-1, PZ 68 4, PZ 68-8 and PZ 20-1 to be installed in the foundation gravels by government and extended above the gravel by contractor
For details see this sheet and Dwg. No. E2

ALINEMENT MONUMENTS LINE "A"

NUMBER	STATION	ORIGINAL TOP ELEV
A-1	28+00	[illegible]
A-2	[illegible]	[illegible]
A-3	[illegible]	[illegible]
A-4	[illegible]	[illegible]
A-5	[illegible]	[illegible]
A-6	28+00	[illegible]
A-7	48+00	731.45
A-8	50+00	729.7
A-9	52+00	730.70
A-10	54+00	728.78
A-11	56+00	733.06
A-12	58+00	733.35
A-13	60+00	729.60
A-14	62+00	729.28
A-15	64+00	732.10
A-16	65+00	732.29
A-17	66+00	732.29
A-18	67+00	732.50
A-19	68+00	732.25
A-20	69+00	732.54
A-21	70+00	732.51
A-22	71+00	733.30

*Note: [illegible] top elevation determined by government
* Instrument Monuments

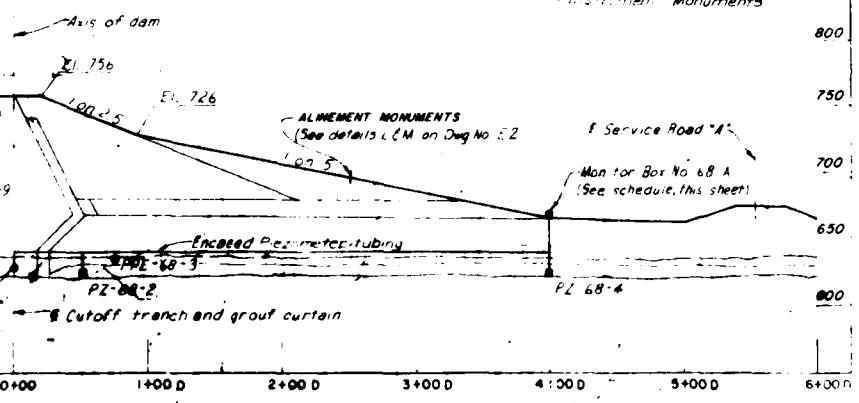
ALINEMENT MONUMENTS LINE "B"

NUMBER	STATION	ORIGINAL TOP ELEV
B-1	[illegible]	[illegible]
B-2	[illegible]	[illegible]
B-3	[illegible]	[illegible]
B-4	[illegible]	[illegible]
B-5	[illegible]	[illegible]
B-6	[illegible]	696.23
B-7	[illegible]	695.94
B-8	[illegible]	696.28
B-9	[illegible]	696.23
B-9	[illegible]	696.66
B-10	[illegible]	695.08
B-	[illegible]	698.39
B-12	[illegible]	695.95
B-13	65+00	695.6
B-14	66+00	696.96
B-15	67+00	695.76
B-16	68+00	696.8
B-17	69+00	697.18
B-18	[illegible]	697.4
B-19	[illegible]	694.53

SCHEDULE OF INCLINOMETERS DEVICES (TEMPORARY)

INCLINOMETER NUMBER	STATION	RANGE	ELEVATION
*M66	[illegible]	3+00 U	5ft into bedrock
*M69	66+[illegible]	3+00 U	5ft into bedrock

Inclinometer devices to be installed through the cofferdam by government and abandoned after remaining embankment construction reaches the fill elevation at the device



Symbol | Revisions | Date | Approved

ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

US Army Corps of Engineers

CONSTRUCTION FOUNDATION REPORT

OBSERVATION DEVICES
MAIN EMBANKMENT

Sheet number

MARCH 1985

No. 0-12-9290

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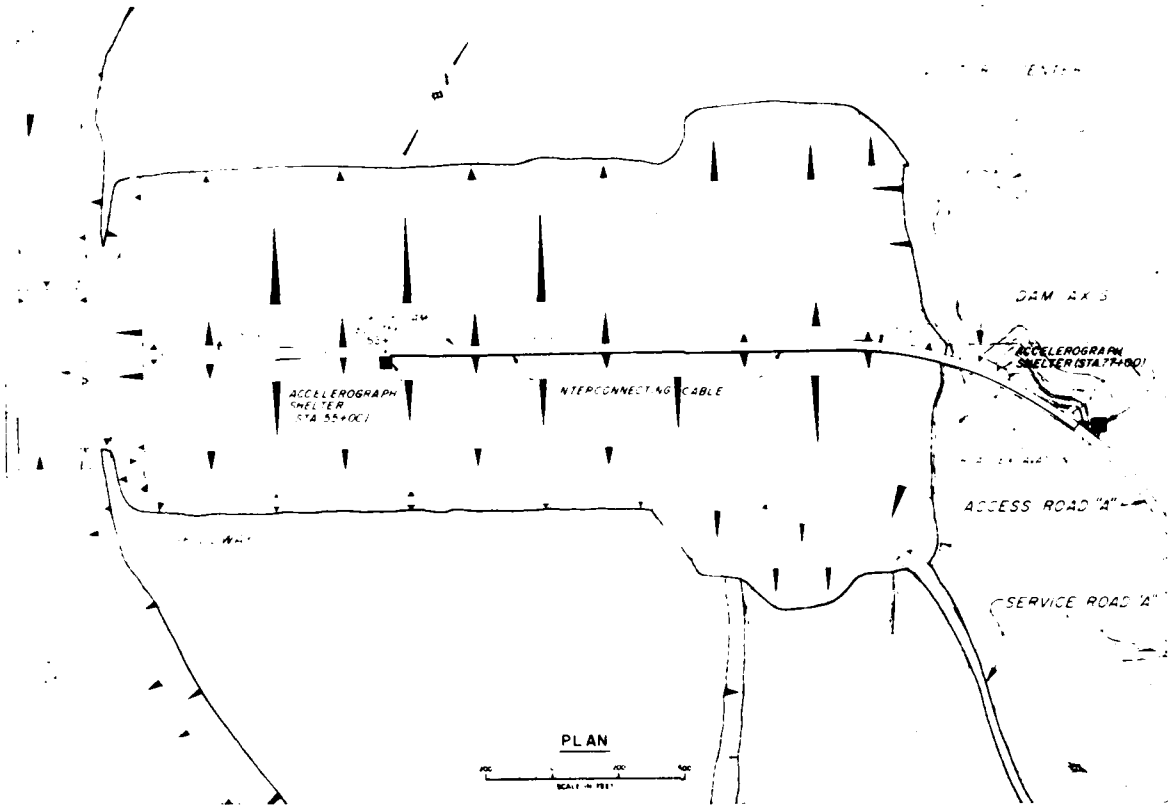
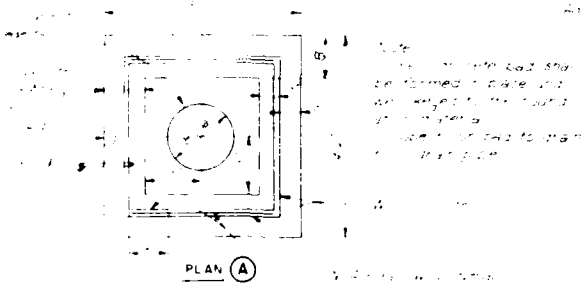
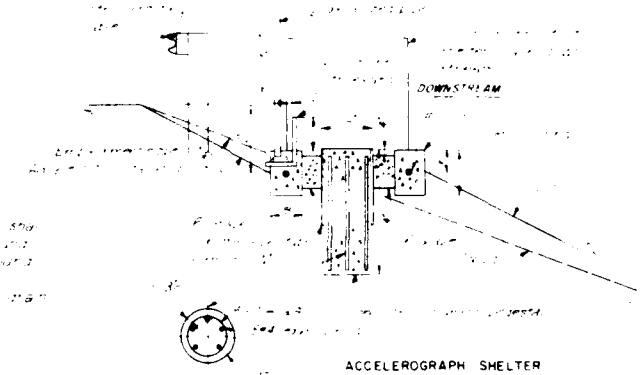


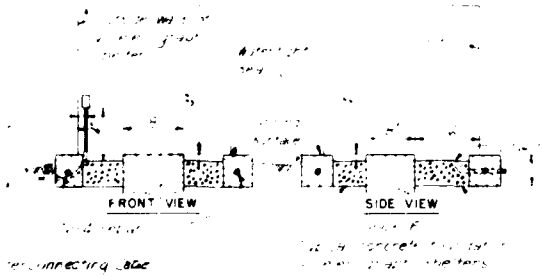
PLAN



PLAN (A)



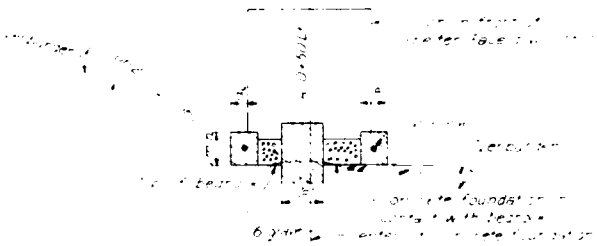
ACCELEROGRAPH SHELTER
CREST INSTALLATION
STA 55+00
SECTION



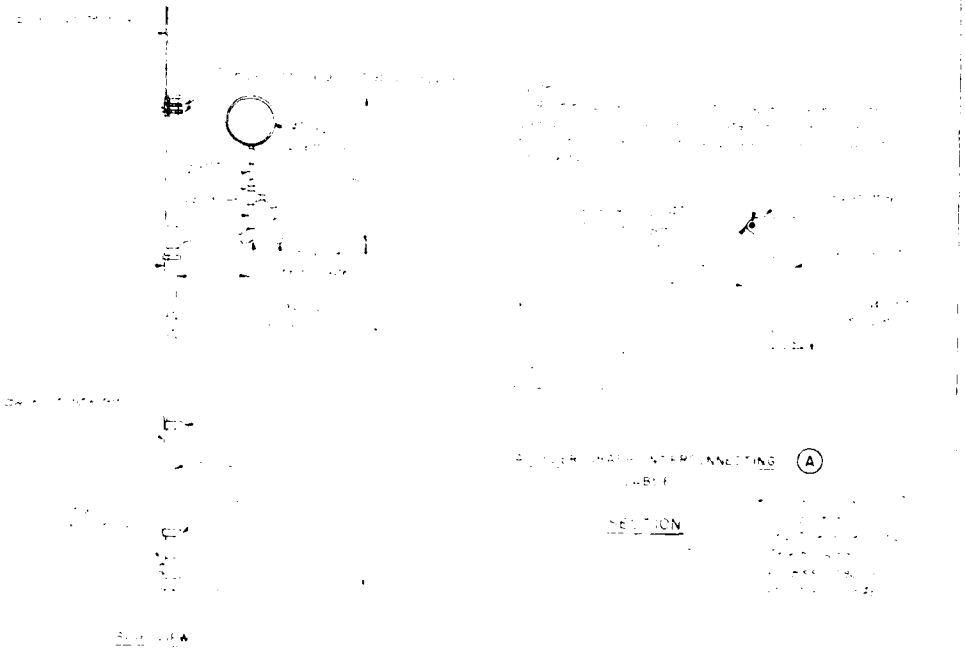
FRONT VIEW

SIDE VIEW

ACCELEROGRAPH SHELTER (A)



ACCELEROGRAPH SHELTER
ABUTMENT INSTALLATION (A)
STA 77+00
SECTION



MOUNTING MAST AND SOLAR CELL INSTALLATION

DRAWINGS IN THIS FOLIO HAVE BEEN REDUCED TO ONE HALF THE ORIGINAL SCALE

ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
CAMBRIDGE, MASSACHUSETTS

CONSTRUCTION FOUNDATION REPORT

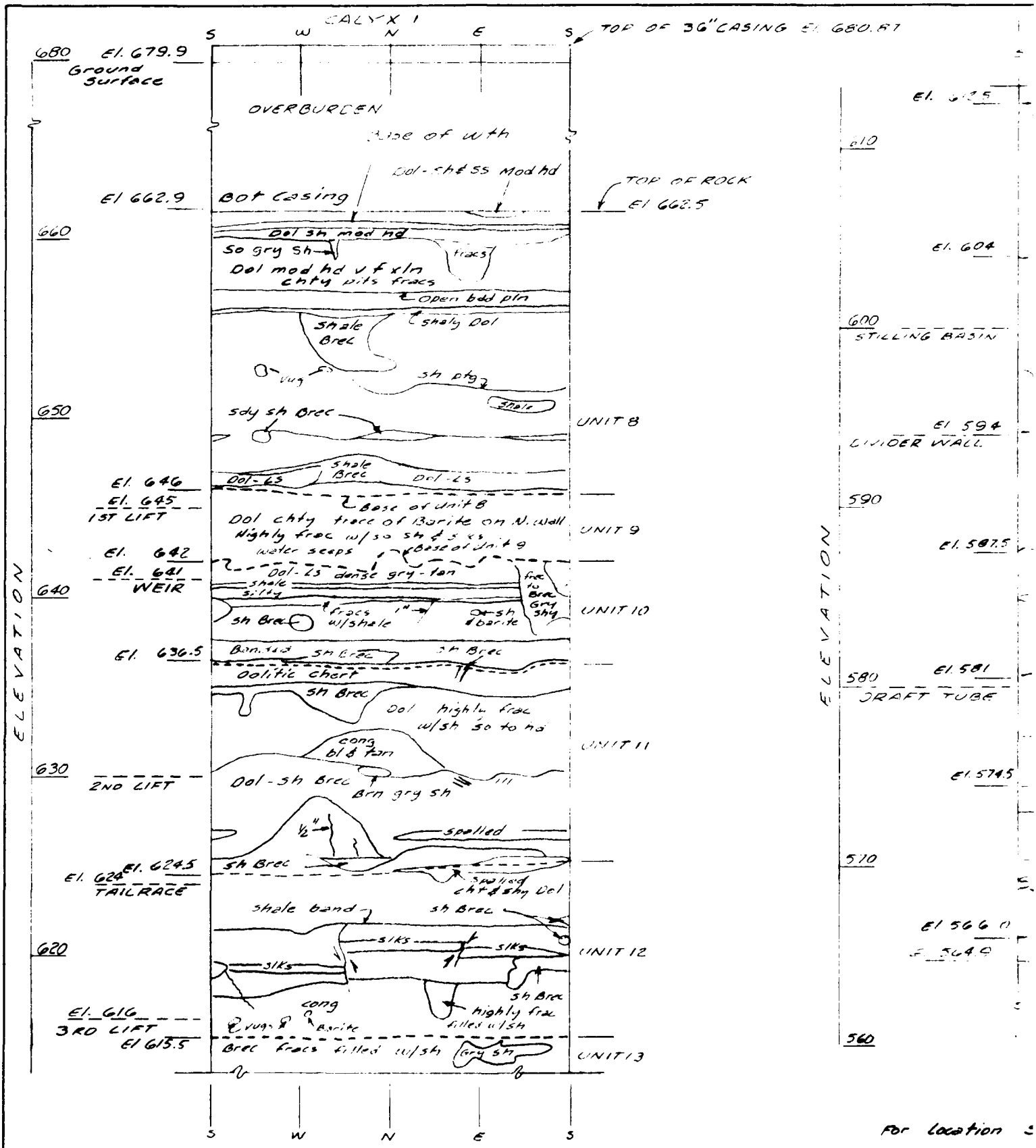
STRONG MOTION ACCELEROGRAPH
PLAN AND DETAILS

0-12-9291

PLATE NO 16

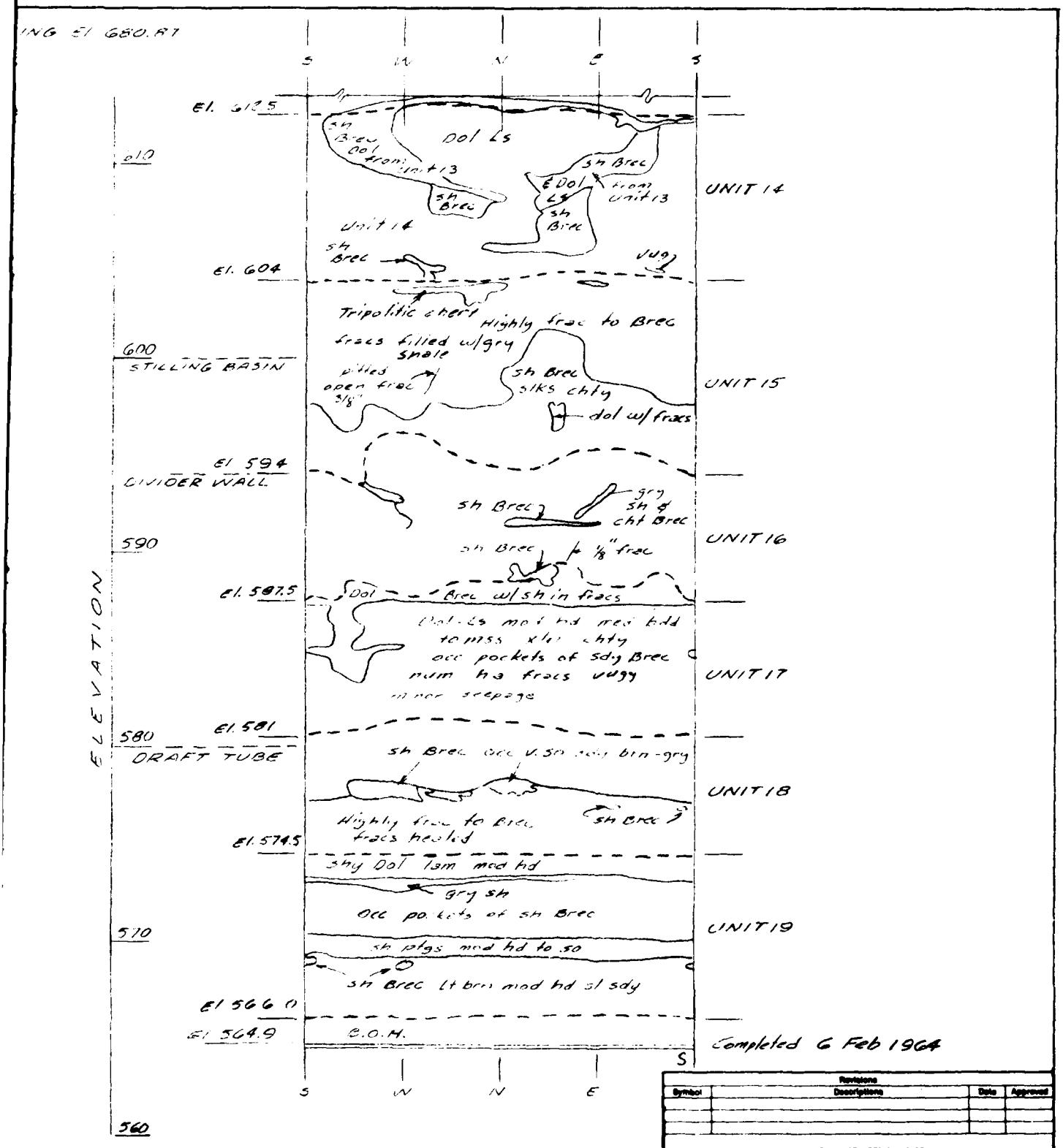
STAGE I CONSTRUCTION

TRUCTION



LOG OF CALYX HOLE NO 1

0 5
SCALE IN FEET



For location See Plan of Borings Plate 2

F NO 1

0 5
SCALE IN FEET

Revisions			
Symbol	Descriptions	Date	Approved

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CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

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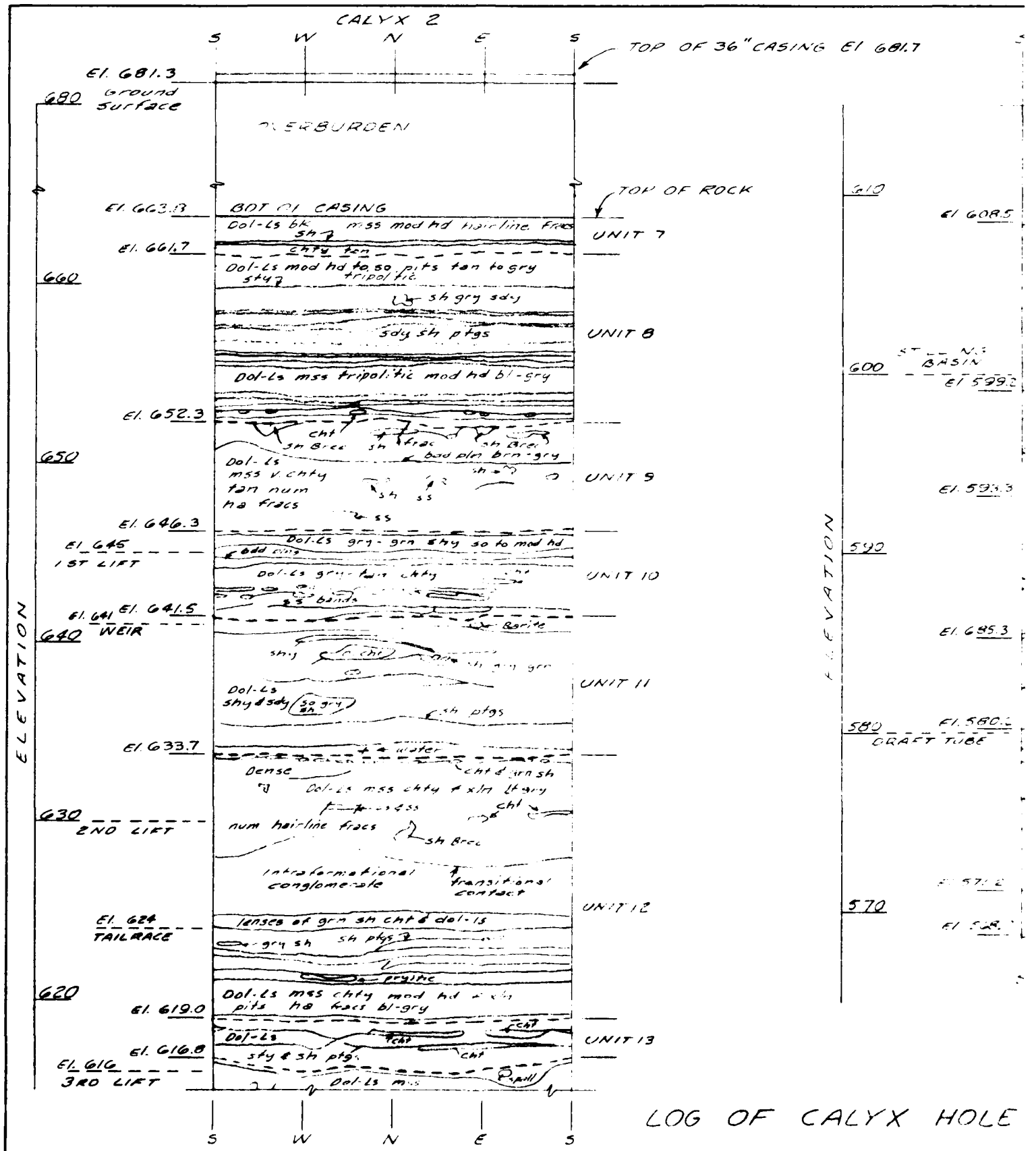
Drawn by
Checked by
Submitted by

OSAGE RIVER, MISSOURI
HARRY S. TRUMAN DAM & RESERVOIR
CONSTRUCTION FOUNDATION REPORT

LOG OF CALYX
HOLE NO. 1

Scale AS SHOWN
Date MARCH 1966
Sheet number
File no. 0-12-9292

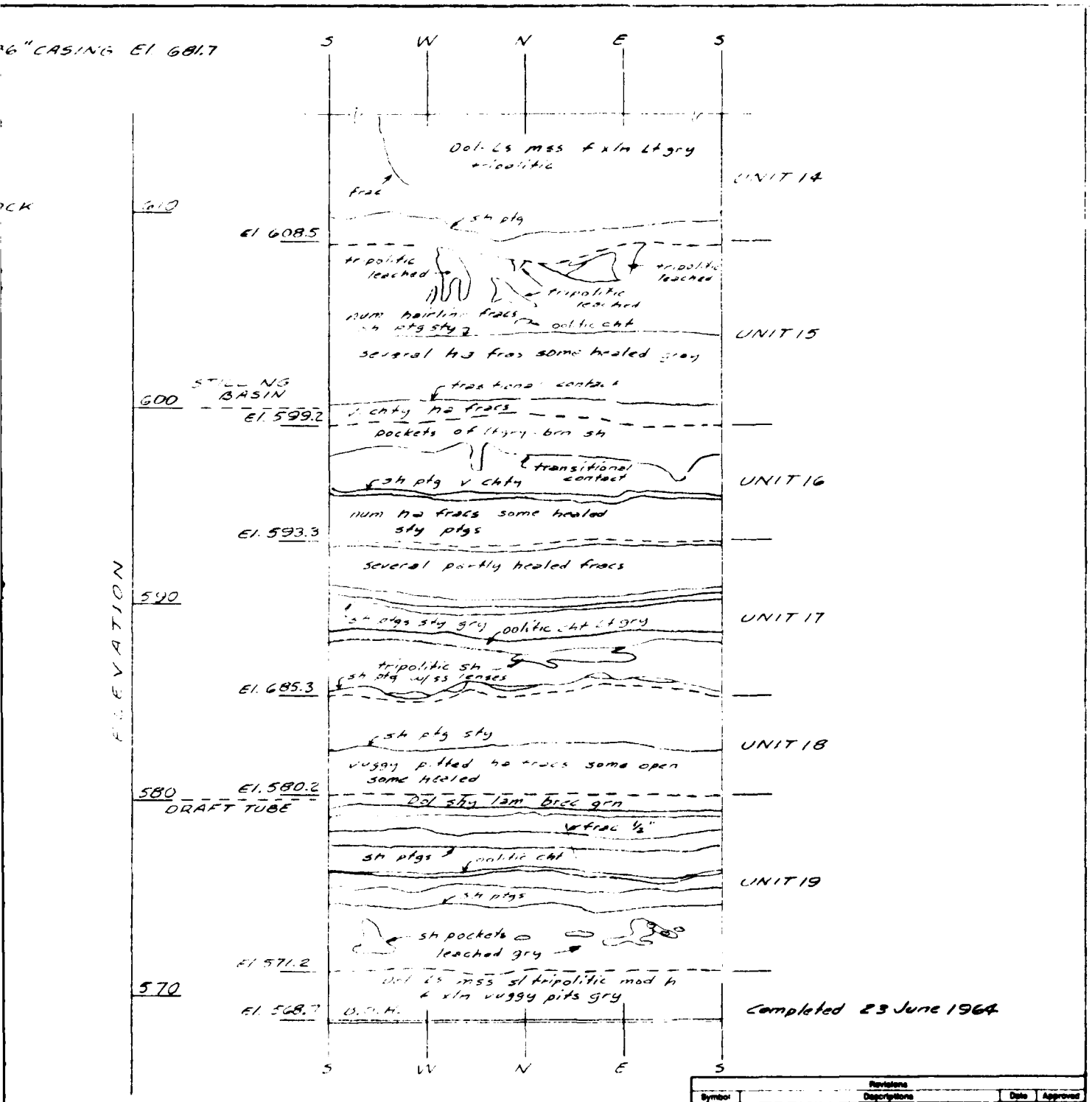
PLATE NO. 161



LOG OF CALYX HOLE

For Location See Plan of Borings Plate 2

SCALE IN F



OF CALYX HOLE NO 2

Plan of Borings

0 5

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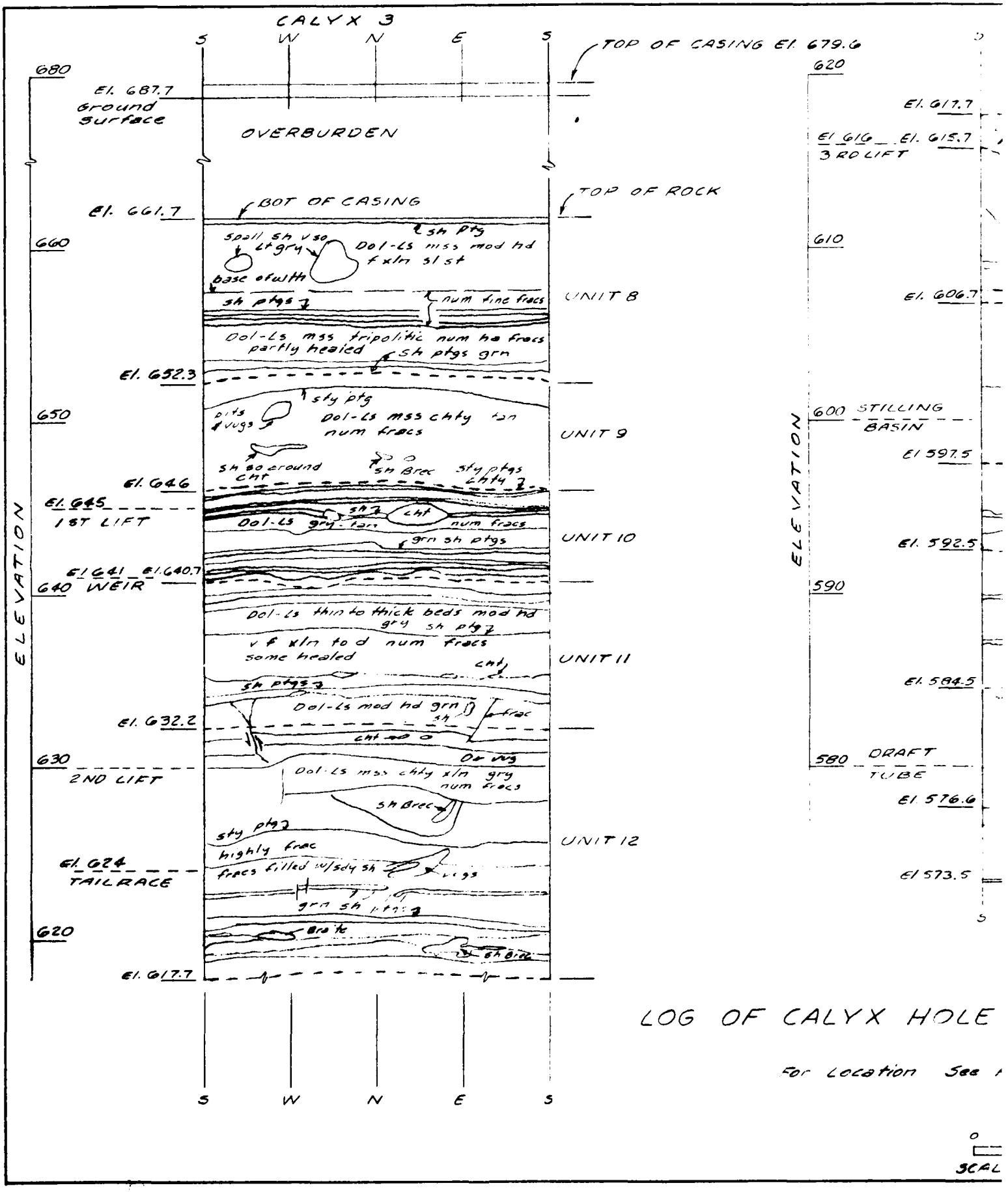
LOG OF CALYX
HOLE NO. 2

Scale AS SHOWN
Date MARCH 1966
Sheet number
Drawing No. 0-12-9293

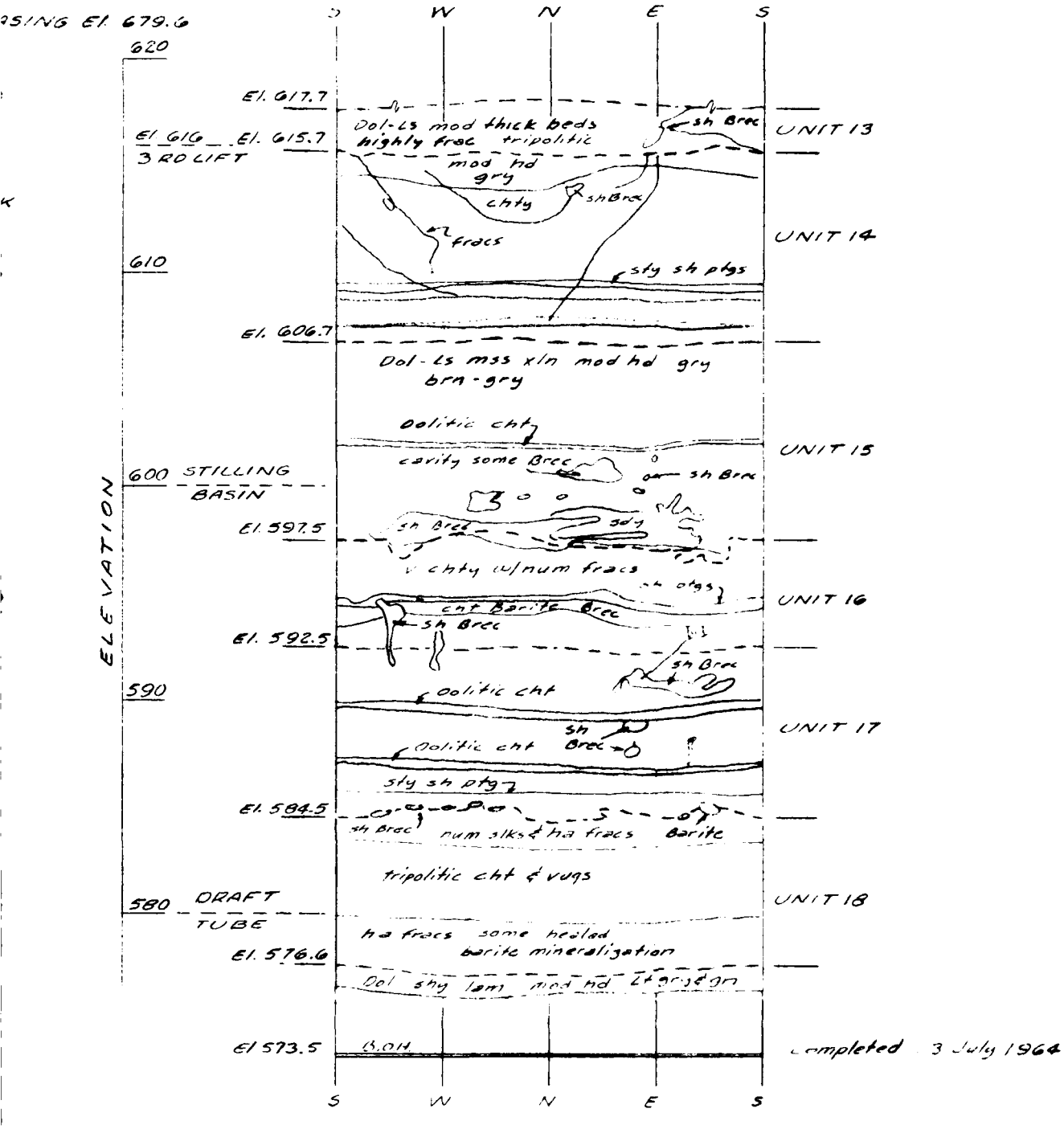
PLATE NO. 162



LOG OF CALYX HOLE

For Location See

SCAL



Completed 3 July 1964

OF CALYX HOLE NO 3

For Location See Plan of Borings Plate 2

0 5
SCALE IN FEET

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Symbol	Descriptions	Date	Approved

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CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

OSAGE RIVER, MISSOURI
HARRY S. TRUMAN DAM & RESERVOIR
CONSTRUCTION FOUNDATION REPORT

LOG OF CALYX
HOLE NO. 3

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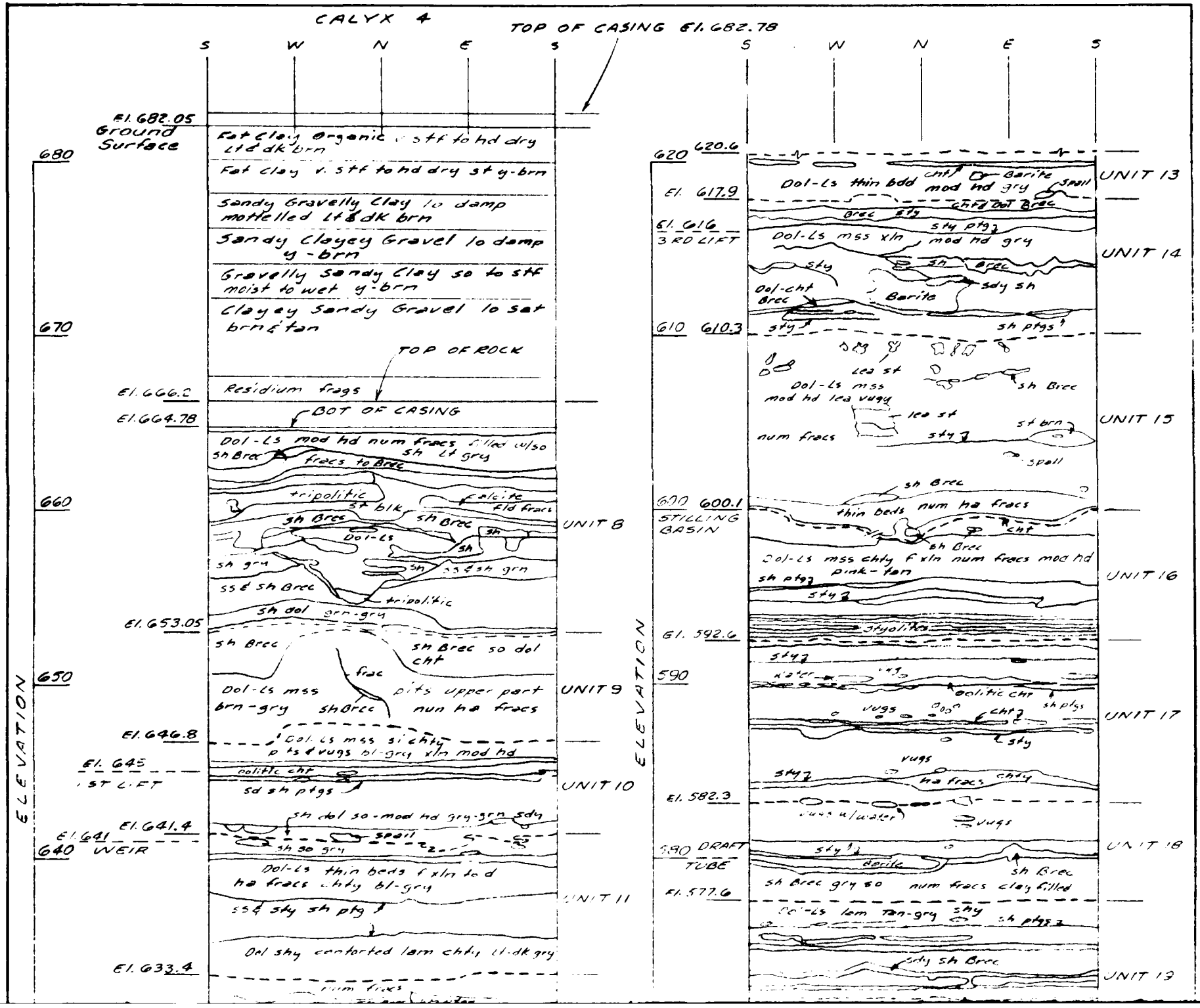
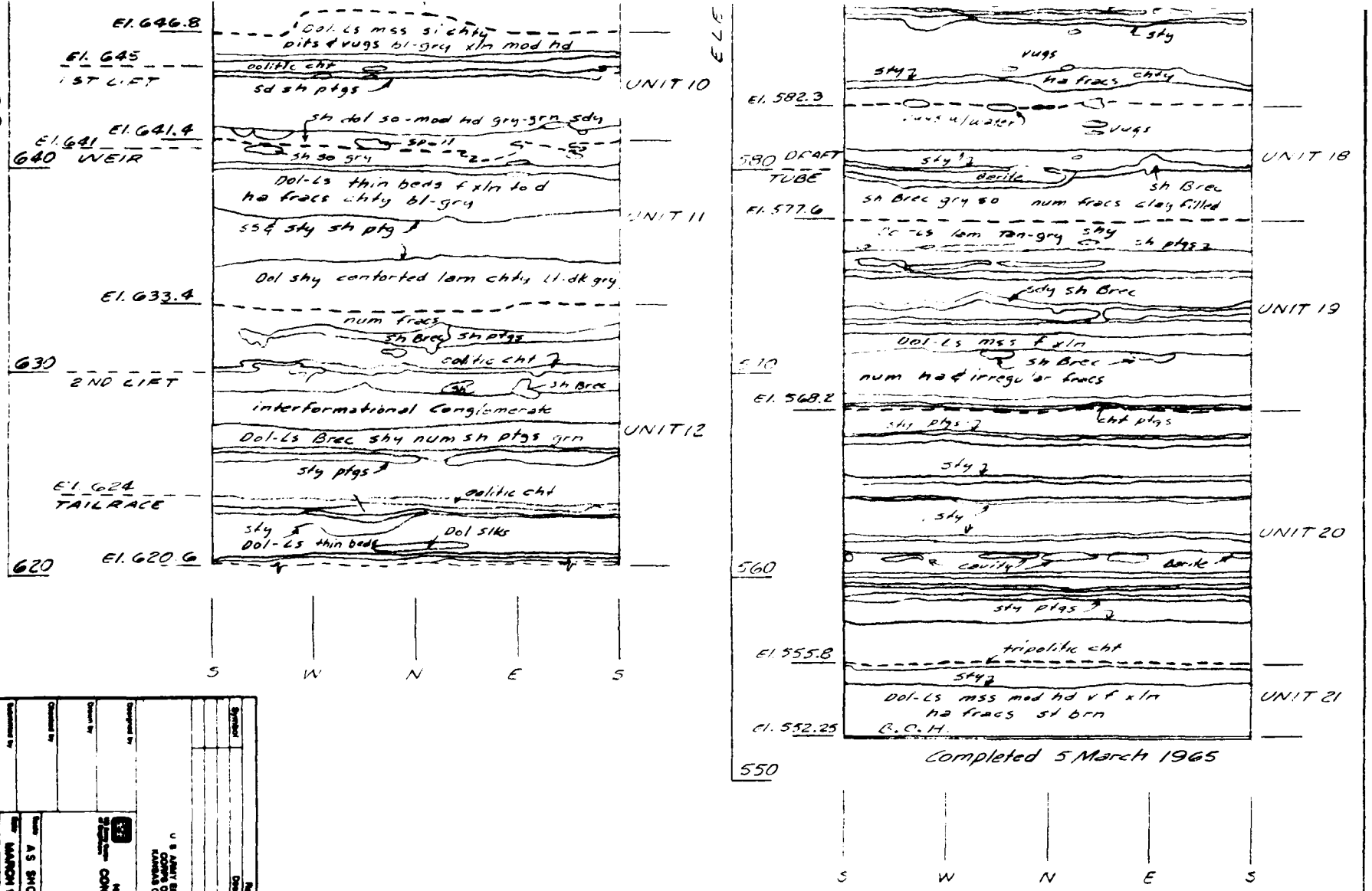
Date MARCH 1966
Sheet number
File No. 0-12-9294


CALYX 4
TOP OF CASING El. 682.78
S W N E S
El. 682.05
Ground Surface
Fat Clay Organic v. stf to hd dry Lt & dk brn
Fat Clay v. stf to hd dry sty y-brn
Sandy Gravelly Clay lo damp mottelled Lt & dk brn
Sandy Clayey Gravel lo damp y-brn
Gravelly Sandy Clay so to stf moist to wet y-brn
Clayey Sandy Gravel lo sat brn & tan
TOP OF ROCK
Residium frags
El. 666.2
El. 664.78
BOT OF CASING
Dol-Ls mod hd num fracs filled w/so sh Lt gry
sh Brec
fracs to Brec
tripolitic
calcite
Fld fracs
sh blk
sh Brec
Dol-Ls
sh gry
ss & sh grn
ss & sh Brec
sh dol grn-gry
El. 653.05
sh Brec
sh Brec so dol cht
frac
Dol-Ls mss brn-gry
pits upper part num ha fracs
El. 646.8
Dol-Ls mss si chty pts & vugs bl-gry xln mod hd
El. 645
1ST LIFT
oolitic cht
sd sh ptgs
El. 641.4
El. 641
640 WEIR
sh dol so-mod hd gry-grn sdy
spall
sh so gry
Dol-Ls thin beds f xln to d ha fracs chty bl-gry
ss & sty sh ptg
Dol sty contorted lam chty lt-dk gry
El. 633.4
num fracs
UNIT 8
UNIT 9
UNIT 10
UNIT 11
ELEVATION
680
670
660
650
640
620.6
620
El. 617.9
Dol-Ls thin bdd mod hd gry
cht
Barite
spall
Brec sty
cht & Dol Brec
El. 616
3RD LIFT
Dol-Ls mss xln mod hd gry
sty ptg
sty
sh Brec
sdy sh
Dol-cht Brec
Barite
610 610.3
sty
sh ptgs
lea st
Dol-Ls mss mod hd lea vugs
sh Brec
lea st
num fracs
sty
st brn
spall
sh Brec
600 600.1
STILLING BASIN
thin beds num ha fracs
cht
sh Brec
Dol-Ls mss chty f xln num fracs mod hd pink-tan
sh ptg
sty
stylolites
El. 592.6
sty
590
water
oolitic cht
sh ptgs
vugs
cht
sty
vugs
sty
ha fracs chty
El. 582.3
vugs w/water
vugs
580 DRAFT TUBE
sty
barite
sh Brec
sh Brec gry so num fracs clay filled
El. 577.6
Dol-Ls lam tan-gry sty
sh ptgs
sdy sh Brec
UNIT 13
UNIT 14
UNIT 15
UNIT 16
UNIT 17
UNIT 18
UNIT 19



LOG OF CALYX HOLE NO 4

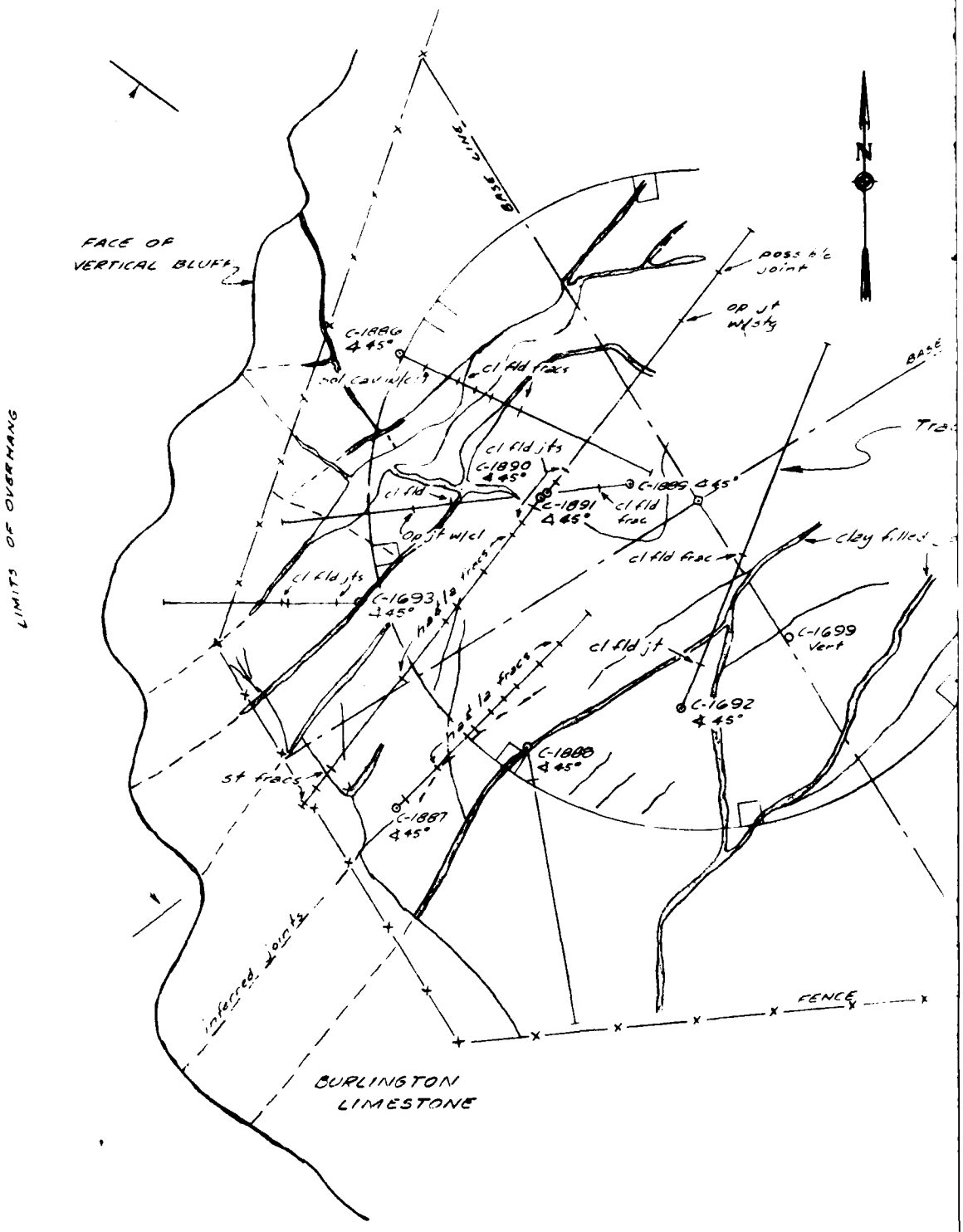
For Location See Plan of Borings Plate

0 5

SCALE IN FEET

U. S. ARMY ENGINEER DISTRICT, CORPS OF ENGINEERS, KANSAS CITY, MISSOURI	Revisions: Symbol, Descriptions, Date, Approved
Designed by	
Drawn by	
Checked by	
Submitted by	
OSAGE RIVER, MISSOURI; HARRY S. TRUMAN DAM & RESERVOIR; CONSTRUCTION FOUNDATION REPORT	
LOG OF CALYX HOLE NO. 4	
Scale: AS SHOWN	Sheet number
Date: MARCH 1966	
File No. 0-12-9295	

PLATE NO. 164

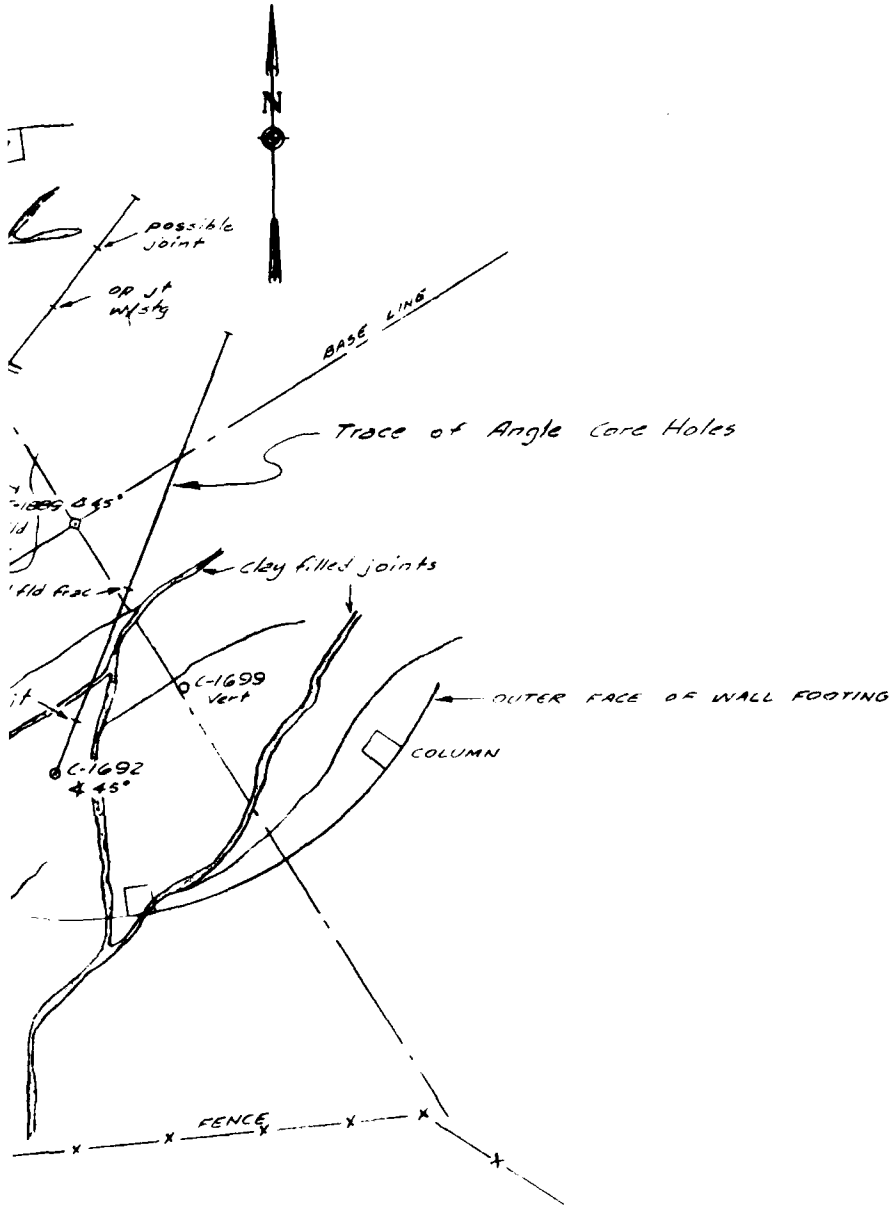


FOUNDATION MAP VISITOR CENTER

WITH ANGLE BORING DATA

0 10

SCALE IN FEET



VTER

JULY 1975

Revisions			
Symbol	Descriptions	Date	Approved

U S ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

OSAGE RIVER, MISSOURI
HARRY S. TRUMAN DAM & RESERVOIR
CONSTRUCTION FOUNDATION REPORT

FOUNDATION MAP,
VISITOR CENTER

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Checked by
Submitted by

Scale: AS SHOWN
Date: MARCH 1966
Sheet number
File No. 0-12-9296

PLATE NO. 165

TABLE

TABLE D-2
SHOT DATA - HARRY S. TRUMAN DAM
STAGE II BLASTING

1st LIFT

SHOT NUMBER	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
YIELD (CUBIC YARDS)	2,4,[illegible]	996	2963	4,87	4730	4400	4735	4667	4021	4249	4200	3851	4393	4458	4,7[illegible]	4827	4216	4,38	2520	253
EXPLOSIVES (LBS)	45[illegible]	4,[illegible] GEL 2	560 GEL 2	800 GEL 2	375 GEL 2	350 GEL 2	725 GEL 2	775 GEL 2	500 GEL 2	275 GEL 2	625 GEL 2	600 GEL 2	650 GEL 2	300 GEL 2	675 GEL 2	300 GEL 2	650 GEL 2	550 GEL 2	200 GEL 2	[illegible]
TYPE & AMOUNT	[illegible] HERC	[illegible] 3 HERC 4	2 HERCOL 4	2050 HERCOL 4	3200 HP 9	3225 HP 9	2875 HP 9	2000 HER 4	1125 HERC 800 HP 9	2350 HP 9	1360 HERC	350 HERC	1550 HERCOL	1450 HP 9 575 HERCOL	1425 HERCOL	400 HP 9 500 HERCOL	525 HERCOL	200 HERCOL	375 HERCOL 1000 HP 9	8[illegible] HERC
ROWS	4	5	3	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	5
NUMBER OF HOLES	45	4[illegible]	56	80	70	72	72	80	A 40 B 18	53	62	62	66	60	66	63	66	57	42	37
BURDEN SPACING	7x11	7x11	7x11	7x11	8x12	8x12	8x12	7x11	7x14	7x14	7x14	7x14	7x14	7x14	7x14	7x14	7x14	7x14	7x14	7x[illegible]
BENCH HEIGHT	2[illegible]	20	2[illegible]	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
HOLE DEPTH	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22
COLUMN LOAD (AVERAGE)	13 HERCOL 4	13 HERCOL 4	10 HERCOL 4	14 HERCOL 4	9 HP 9	5 HP 9	7 HP 9 SEL 2 4 HP 9	12 HERCOL 4	A 14 HER 9 HP 9 B	9 HP 9	12 HERCOL 4	12 HERCOL 4	13 HERCOL 4	ALTERNATE 5 HERCOL 4 4 HP 9	11 HERCOL 4	ALTERNATE 4 HP 9 4 HERCOL 4 3 HP 9	12 HERCOL 4		ALTERNATE 4 HP 9 4 HERCOL 4 GEL 2 1 HP 9	12 HERC
TOE CHARGE	2 GEL 2	2 GEL 2	2 GEL 2	2 GEL 2	1 GEL 2	1 GEL 2	1 GEL 2	2 GEL 2	2 GEL 2 1 GEL 2	1 GEL 2	2 GEL 2	2 GEL 2	2 GEL 2	1 GEL 2 HP 9	2 GEL 2	1 GEL 2 HP 9	2 GEL 2			2 GEL
STEMMING	5'	ROW 1 7.5' ROW 2 6.5' ROW 3 5.5	ROW 1 6.2 6.7' ROW 3 5.5	5.0	5.5	5.5	6.0	5.5 AVRG	6.0	6.0	5.0	5.0	5-6	6	6'	7'	5	5	6	5
DELAY (BY ROW)	1, 2, 3, 4	0, 1, 2, 3, 4	1, 2, 3	0, 1, 2, 4	0, 1, 2, 4	0, 1, 2, 4	0, 1, 2, 4	0, 1, 2, 4	0, 1, 2, 4	0, 1, 2, 4	0, 1, 2, 3	0, 1, 2, 3	0, 1, 2, 3	0, 1, 2, 3	1, 2, 3, 4	0, 1, 2, 3	0, 1, 2, 3	0, 1, 2, 3	0, 1, 2	[illegible]
THEORETICAL PF	0.62	0.60	0.50	0.63	0.72	0.70	0.70	0.61	A 0.52 B 0.69	0.69	0.44	0.44	0.46	0.53	0.44	0.48	0.45	0.42	0.52	0.4
ACTUAL PF	0.66	0.69	0.56	0.68	0.76	0.81	0.76	0.59	A 0.56 B 0.68	0.62	0.47	0.51	0.50	0.52	0.50	0.45	0.52		0.62	0.4
GRADATIONS		GRAD 1	GRAD 2			GRAD. 3										GRAD 4		NOT DOCUMENTED		
BLASTING RATIOS																				
$K_B = \frac{2B}{D_e}$	42.0	42.0	42.0	42.0	32.0	32.0	32.0	42.0	28 w/HP 9 42 w/HERCOL	28	42	42	42	28-42	42	28-42	42	42	28-42	4[illegible]
$K_H = \frac{H}{B}$	3.14	3.14	3.14	3.14	2.75	2.75	2.75	3.14	3.14	3.14	3.14	3.14	3.14	3.14	3.14	3.14	3.14	3.14	3.14	3.[illegible]
$K_J = \frac{J}{B}$	0.29	0.29	0.29	0.29	0.25	0.25	0.25	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29
$K_T = \frac{T}{B}$	0.72	ROW 1 0.86 2 0.72	ROW 1 0.93 3 0.79	0.72	0.69	0.69	0.75	0.79	0.86	0.86	0.72	0.72	0.79	0.86	0.86	0.0	0.72	0.72	0.86	0.7[illegible]
$K_S = \frac{S}{B}$	1.57	1.57	1.57	1.57	1.50	1.50	1.50	1.57	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	[illegible]

2nd LIFT

SHOT NUMBER	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
YIELD (CUBIC YARDS)	2700	4400	1737	2268	2170	2350	1839	633	1945	1590	711	1850	2822	1003	1310	661	2108	1415	2380	59
EXPLOSIVES (LBS)	1000 GEL 2	1750 GEL 2	150 GEL 2	175 GEL 2	250 GEL 2	225 GEL 2	150 GEL 2	50 GEL 2	250 GEL 2	100 GEL 2	65 GEL 2	200 GEL 2	275 GEL 2	50 GEL 2	225 GEL 2	150 GEL 2	350 GEL 2	300 GEL 2	400 GEL [illegible]	[illegible]
TYPE & AMOUNT	10 GEL 1 750 HERCOL 4	1400 HERCOL	450 HERCOL	450 HERCOL	8 GEL 1 850 HERC	7 GEL 1 800 HERC	450 HERCOL	3 GEL 1 150 HERC	550 HERCOL	325 HERCOL	200 HERCOL	7 GEL 1 550 HERC	3 GEL 1 750 HERC	200 HERC	400 HERC	150 HERC	350 HERCOL	350 HERCOL	6 GEL 500 HERC	250 HER[illegible]
ROWS	10	10	4	2 TO 5	10	10	2	3	7	2-3	3	5	3	3	2 TO 3	3	3	4	5	5
NUMBER OF HOLES	81	142	35	36	61	59	34	17	45	24	16	47	57	16	32	15	36	32	4[illegible]	
BURDEN SPACING	7x10	7x10	7x14	7x14	7x10	7x10	7x14	7x14	7x10	7x14	7x14	7x14	7x14	7x14	7x14	7x14	7x14	7x14	7x14	7x
BENCH HEIGHT	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	5	
HOLE DEPTH	17	17	17	17	17	17	17	17	17	17	[illegible]	17	[illegible]	17	17	[illegible]	[illegible]	[illegible]		
COLUMN LOAD (AVERAGE)	5 HERC 4	5 HERC 4	7 HERC 4	6-7 HERCOL 4	8 HERC 4	8 HERCOL	7 HERCOL	7 HERCOL	8 HERCOL	8 HERCOL	7 HERC 4	7 HERC 4	7 HERCOL	7 HERCOL	6 HERCOL	6 HERCOL	ALT 6 & 5 HERCOL	ROWS 1-3 5H ROW 4 & 6 HER	ROW 4 5H ROW 5 & 6 HER	ROWS [illegible] HP 9 [illegible]
TOE CHARGE	3 GEL 2	3 GEL 2	1 GEL 2	1 GEL 2	1 GEL 2	1 GEL 2	1 GEL 2	1 GEL 2	1 GEL 2	1 GEL 2	1 GEL 2	1 GEL 2	1 GEL 2	1 GEL 2	2 GEL 2	2 GEL 2	1 GEL 2	2 GEL 2	2 GEL	[illegible]
STEMMING	5	5	5	5	5	5-1/2 AVRG	6 AVRG	6 AVRG	5	5	5	5	5	5	5	5	5-6	5-6	5-6	[illegible]
DELAY (BY ROW)	(CONF) TOW CENTER	(CONF) TOW CENTER	0, 1, 2	0, 1, 2, 3, 4	0, 1, 2, 3, 4 CTR FC PULL	0, 1, 2, 3, 4, 5 CTR FC PULL	0, 1	0, 1, 2	0, 1, 2, 3, 4, 5	0, 1, 2	0, 1, 2, 3, 4	0, 1, 2	0, 1, 2	0, 1, 2	0, 1, 2	0, 2, 3	[illegible]	0, 1, 2, 3	[illegible] 3, 4	
THEORETICAL PF	0.56	0.57	0.32	0.32	0.47	0.45	0.32	0.22	0.46	0.32	0.30	0.30	0.33	0.29	0.36	0.36	0.36	0.37	0.34	[illegible]
ACTUAL PF	0.65	0.72	0.34	0.28	0.51	0.44	0.33	0.32	0.41	0.27	0.37	0.41	0.36	0.24	0.48	0.45	0.33	[illegible]	36	
GRADATIONS		GRAD 5		GRAD 6									GRAD 7							
BLASTING RATIOS																				
$K_B = \frac{2B}{D_e}$	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	4[illegible]
$K_H = \frac{H}{B}$	2.43	2.43	2.43	2.43	2.43	2.43	2.43	2.43	2.43	2.43	2.43	2.43	2.43	2.43	2.43	2.43	2.43	2.43	2.43	2.4
$K_J = \frac{J}{B}$	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.[illegible]
$K_T = \frac{T}{B}$	0.72	0.72	0.72	0.72	0.72	0.79	0.72-1.00	0.72-1.00	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.86	0.93-1.00	[illegible]	[illegible]	0.93
$K_S = \frac{S}{B}$	1.40	1.40	2.0	2.0	1.4	1.4	2.0	2.0	1.4	2.0	2.0	1.4	2.0	2.0	2.0	2.0	2.0	2.0	2	[illegible]

3rd LIFT

SHOT NUMBER	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
YIELD (CUBIC YARDS)	1395	1425	1220	590	1365	720	840	2680	2040	2350	3660	1760	2020	2860	1978	503	3960	933	2475	[illegible]
EXPLOSIVES (LBS)	250 GEL D	600 GEL D	250 GEL D	90 GEL D	275 GEL D	100 GEL D	100 GEL D	700 GEL D	675 GEL D	200 GEL D	225 GEL D	175 GEL D	200 GEL D	275 GEL D	400 GEL D	400 GEL D	750 GEL D 500 HP 9	400 GEL D 150 HP 9	400 GEL D 200 HERC 4	250 H 400 HE
TYPE & AMOUNT	1 GEL 1 490 HERC 4	650 HERC 4	250 HERC 4	200 HERC 4	500 HERC 4	200 HERC 4	150 HERC 4	675 HERC 4	700 HERC 4	2 GEL 1 550 HERC 4	700 HP 9 525 HERC 4	400 HP 9 125 HERC 4	275 HERC 4 500 HP 9	375 HP 9 175 HERC 4	500 HP 9	400 HP 9 200 HERC 4	525 HERCOL 4	150 HERCOL 4	150 GEL 2 125 HP 9	65 [illegible]
ROWS	5	7	3	3	7	3	2	6	3	3	6	3	4	3	3	4	3	6	3	3
NUMBER OF HOLES	40	50	20	15	38	13	13	41	32	34	56	27	31	32	31	33	60	32	38	49
BURDEN SPACING	7x12	7x12	7x14	7x14	7x12	7x14	7x14	7x14	7x14	7x14	7x14	7x14	7x14	7x14	7x14	7x14	7x14	7x14	7x14	7x
BENCH HEIGHT	16	16	16	16	16	18	18	18	18	18	18	18	18	18	17	17	17	17	15	
HOLE DEPTH	18	18	18	18	18	19	19	19	19	19	19	19	19	19	19	19	19	19	19	9
COLUMN LOAD (AVERAGE)	8 HERCOL 4	8 HERC 4	7 HERC 4	7 HERC 4	8 HERC 4	8 HERC 4	8 HERC 4	6 HERC 4	8 HERC 4	8 HERC 4	3 HP 9 4 HERC 4	1 IN 8 5 HP 9 2 IN 8 3 HP 9	ALT 4 IN 4 8 3 HP 9	1 HERC 4 4 HP 9	5 HP 9	ALT SH. 2 HP FOR 8 STEM 8 ALL SH FOR 4 STEM 2 LINE	ALT SH. THE FOR 3" 8 IN FOR 3" 4 STEM 2 LINE	ALT HERC 4 8 HP 9	ALT HERC 4 8 HP 9 2 GEL D OR 2 GEL 2	7 HP9 1 6 HERC 3 HERC
TOE CHARGE	1 GEL D	2 GEL D	2 GEL D	1 GEL D	1 GEL D	1 GEL D	1 GEL D	2 GEL D	1 GEL D	1 GEL D	1 GEL D	1 GEL D	1 GEL D	1 GEL D	2 GEL D	2 GEL D	2 GEL D	2 GEL D	2 GEL D	2 GE
STEMMING	7	5	7	7	6	6	6	6	5	DEPICTED 4 STEM 8 4 STEM	5	DEPICTED 4 & 4 8 & 8	6	7	12	ALT 6 & 8	ALT 7 & 11	ALT 7 & 11	ALT 7 & 11	ALT [illegible]
DELAY (BY ROW)	3, 1, 0, 2, 4	0, 1, 2, 3, 4, 6, 8, 9	0, 1, 3	0, 2, 4	0, 1, 2, 4, 6, 8, 11	0, 1, 3	0, 3	0, 4, 6, 8 10, 11	0, 1, 3	0, 1, 3	0, 1, 2, 4, 6 8, 10	0, 1, 3	0, 1, 2, 4	0, 1, 2, 3, 4, 6, 8, 10	0, 1, 3	ALT IN ROW 0, 1, 2, 3	ALT IN ROW 0, 1, 2, 3, 4	0, 1, 2, 3 4, 5, 6	ALT IN ROW 0, 1, 2, 3, 4	ALT IN 0, 1, 2
THEORETICAL PF	0.37	0.50	0.43	0.33	0.35	0.35	0.29	0.51	0.66	0.34	0.40	0.40	0.48	0.49	0.47	0.49	0.42	0.35	0.42	0.4
ACTUAL PF	0.53	0.88	0.41	0.49	0.57	0.42	0.30	0.51	0.67	0.32	0.40	0.40	0.48	0.36	0.46	0.66	0.40	0.36	0.35	0.4
GRADATIONS																				
BLASTING RATIOS																				
$K_B = \frac{2B}{D_e}$	42	42	42	42	42	42	42	42	42	42	28-42	28-42	28-42	28-42	28	28-42	28-42	28-42	28-42	28
$K_H = \frac{H}{B}$	2.58	2.58	2.58	2.58	2.58	2.72	2.72	2.72	2.72	2.72	2.72	2.72	2.72	2.72	2.72	2.72	2.72	2.72	2.72	2.7
$K_J = \frac{J}{B}$	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.1
$K_T = \frac{T}{B}$	1.00	0.72	1.00	1.00	0.86	0.86	0.86	0.86	0.57-0.72	0.57	0.72	0.57	0.86	1.00	1.70	0.86-1.14	0.93-1.57	1.0-1.57	1.0-1.57	1.0-1
$K_S = \frac{S}{B}$	1.70	1.7	2.00	2.00	1.70	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.0

TABLE D-2
SHOT DATA - HARRY S. TRUMAN DAM
STAGE II BLASTING

WHERE B = BURDEN EXPRESSED IN FEET
D_e = DIAMETER OF EXPLOSIVE CARTRIDGE IN INCHES
H = BENCH HEIGHT IN FEET
J = SUBDRILL DEPTH IN FEET
T = STEM IN FEET
S = SPACING OF HOLES EXPRESSED IN FEET

DRAWINGS IN THIS FOLIO HAVE BEEN REDUCED TO ONE HALF THE ORIGINAL SCALE

	14	15	16	17	18	19	20	21	22	23
	4458	4171	4827	4216	4138	2520	2532	3117	2118	2792
	300 GEL 2 450 HP 9 575 HERCOL	675 GEL 2 1425 HERCOL	300 GEL 2 400 HP 9 500 HERCOL	650 GEL 2 525 HERCOL	550 GEL 2 1200 HERCOL	200 GEL 2 375 HERCOL 1000 HP 9	350 GEL 2 800 HERCOL	200 GEL 2 050 HP 9 375 HERCOL	350 GEL 2 675 HERCOL	525 GEL 2 1150 HERCOL
	4	4	4	4	4	3	3	3	3	2 & 4
	60	66	63	66	57	42	37	45	32	58
	7x14	7x14	7x14	7x14	7x14	7x14	7x14	7x14	7x14	7x14
	20	20	20	20	20	20	20	20	20	20
	22	22	22	22	22	22	22	22	22	22
	ALTERNATING 4 HERCOL 4 4 HP 9	11 HERCOL 4	ALTERNATING 4 HERCOL 4 4 HP 3	12 HERCOL 4		ALTERNATING 4 HERCOL 4 4 HP 9	12 HERCOL 4	ALTERNATING 4 HERCOL 4 4 HP 9	12 HERCOL	12 HERCOL
	1 GEL 2 HP 9	2 GEL 2	1 GEL 2 1 HP 9	2 GEL 2		1 GEL 2 1 HP 9	2 GEL 2	1 GEL 2 1 HP 9	2 GEL 2	2 GEL 2
	6	6'	7'	5	5'	6'	5-1/2	5	6	6
	0,1,2,3	1,2,3,4	0,1,2,3	0,1,2,3	0,1,2,3	0,1,2	0,1,2	0,1,2	0,1,2	0,1,2,3
	0.53	0.44	0.48	0.45	0.42	0.52	0.43	0.50	0.48	0.40
	0.52	0.50	0.45 GRAD 4	0.52	NOT DOCUMENTED	0.62	0.45	0.52	0.48	0.60
	28-42	42	28-42	42	42	28-42	42	28-42	42	42
	3.14	3.14	3.14	3.14	3.14	3.14	3.14	3.14	3.14	3.14
	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29
	0.86	0.86	1.00	0.72	0.72	0.86	0.72	0.72	0.86	0.86
	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00

	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33
	1003	1310	661	2108	1415	2380	1594	2570	2495		[illegible]	[illegible]	[illegible]	293	[illegible]	[illegible]	[illegible]	2775	945	864
	50 GEL 2 200 HERC	225 GEL 2 400 HERC	150 GEL 2 150 HERC	350 GEL 2 350 HERCOL	300 GEL 2 350 HERCOL	400 GEL 2 6 GEL 1 500 HERC	225 GEL 2 250 HERCOL	450 GEL 2 600 HERCOL	450 GEL 2 675 HERCOL		[illegible]	[illegible]	[illegible]	225 GEL 2	[illegible]	[illegible]	[illegible]	550 GEL 2	115 GEL 2 50 GEL 1 700 HERC	150 GEL 2 34 GEL 1 675 HERC
	3	2 TO 3	3	3	4	5	3	4	4		[illegible]	[illegible]	[illegible]	4	[illegible]	[illegible]	[illegible]	[illegible]	3	2
	16	32	15	36	32	49	[illegible]	[illegible]	[illegible]		[illegible]	54	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	54	59	48
	7x14	7x14	7x14	7x14	7x14	7x14	7x14	7x14	7x14		7x14	7x14	7x14	7x14	7x14	7x14	7x14	7x14	7x14	7x14
	15	15	15	15	15	15	[illegible]	5	[illegible]		[illegible]	[illegible]	5	5	[illegible]	[illegible]	[illegible]	5	5	4
	17	17	17	17	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	17
	7 HERCOL	6 HERCOL	6 HERCOL	ALT 6 & 5 HERCOL	ROWS 1-3 5H ROW 4 & 6 HER	ROWS 1-4 5H ROW 5 & 6 HER	ROWS 1-5 5H ROW 6 HER	ROWS 1-6 5H ROW 4-7 HER	[illegible] HERC 4		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	6 HERCOL	7 HERCOL
	GEL 2	2 GEL 2	2 GEL 2	GEL 2	2 GEL 2	2 GEL 2	2 GEL 2	2 GEL 2	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	2 GEL 2	2 GEL 2	2 GEL 2	2 GEL 2
	5	5	5	5-6	5-6	5-6	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	5	5 1 2
	0,1,2	0,1,2	0,2,3	0,1,2	0,1,2,3	[illegible]	[illegible]	ALT IN ROWS [illegible]	[illegible]		[illegible]	[illegible]	ALT IN ROWS [illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0,3
	0.29	0.36	0.36	0.36	0.37	0.34	0.32	0.36	4		2	[illegible]	4	4	[illegible]	[illegible]	4	4	38	0.35
	0.24	0.48	0.45	0.33	0.46	58	[illegible]	[illegible]	[illegible]		[illegible]	4	[illegible]	[illegible]	[illegible]	58	4	44	0.44	0.48
	42	42	42	42	42	42	42	42	42		[illegible]	[illegible]	[illegible]	42	42	42	42	42	42	42
	2.43	2.43	2.43	2.43	2.43	2.43	2.43	2.43	2.43		2.43	2.43	2.43	2.43	2.43	2.43	2.43	2.43	2.43	2.43
	0.29	0.29	0.29	0.29	0.29	0.29	0.29	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.29	0.29
	0.72	0.72	0.86	0.93-1.00	[illegible]	[illegible]	0.93	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.86	0.86	0.72
	2.0	2.0	2.0	2.0	2.0	2	[illegible]											2	2.4	2.00

	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34
	2860	1978	1503	3960	1933	2475	2815	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	2380	2700	4170	3490	4060
	275 GEL D	400 GEL D	400 GEL D	750 GEL D 300 HP 9	400 GEL D 150 HP 9	400 GEL D 200 HERC 4	250 HP 9 400 HERC 4	600 GEL D 225 HP 9	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	550 GEL D	925 GEL D	750 GEL D	1050 GEL D
	575 HP 9 175 HERC 4	500 HP 9	400 HP 9 200 HERC 4	525 HERCOL 4	150 HERCOL 4	150 GEL 2 125 HP 9	650 GEL D	4 GEL 2 375 HERC 4	4 GEL 2 HERCOL 4	4 GEL 2 250 HERC 4	450 HERCOL 4	4 GEL 2 650 HERC 4	[illegible]	[illegible]	[illegible]	350 HERCOL 4	350 HERCOL 4	675 HERCOL 4	650 HERCOL 4	1100 HERCOL 4	25 GEL 2 850 HERC 4	150 HERC
	3	3	4	3	6	3	3	6	3	3	3	4	6	3	3	3	3	3	4	4	4
	32	31	33	60	32	38	49	51	41	29	47	57	62	48	45	25	47	44	78	59	89
	7x14	7x14	7x14	7x14	7x14	7x14	7x14	7x14	7x14	7x14	7x14	7x14	7x14	7x14	7x14	7x14	7x14	7x14	7x14	7x14	7x14
	18	17	17	17	17	15	17	17	9	9	9	9	9	8	5	8	17	17	18	18	18
	19	19	19	19	19	19	19	19	9	9	9	19	9	20	20	20	20	20	20	20	20
	1 HERC 4 4 HP 9	3 HP 9	ALT 5H, 2HP FOR 8 STEM 8 IN FOR 7 ALT 5H FOR 6 STEM 2 IN	ALT 5H, 1HP FOR 8 IN STEM 2 IN	ALT HERC 4 8 HP 9	ALT HERC 4 8 HP 9 2 GEL D OR 2 GEL 2	THP 9 W 6 HERC 4 OR 4 HERC 4	SAME AS 20	AVRG (5.1) 4-5 HERC	AVRG (4.5) 4-5 HERC 4	AVRG (5) 4-5 HERC 4	AVRG (5.5) 5-6 HERC 4	AVRG (5.8) 5-6 HERC	AVRG (7.6) 7-8 HERC	AVRG 7.3 7-8 HERC	AVRG 6.8 6-7 HERC	AVRG 7.5 7-8 HERC	AVRG 7.8 7-8 HERC	AVRG 7.4 7-8 HERC	AVRG 7.5 7-8 HERC	AVRG 6.7 6-7 HERC 4
	1 GEL D	2 GEL D	2 GEL D	2 GEL D	2 GEL D	2 GEL D	2 GEL D	2 GEL D	2 GEL D	2 GEL D	2 GEL D	2 GEL D	2 GEL D	2 GEL D	2 GEL D	2 GEL D	2 GEL D	2 GEL D	2 GEL D	2 GEL D	2 GEL D
	7	12	ALT 6' & 8' ALT IN ROW	ALT 7' & 11' ALT IN ROW	ALT 7' & 11' 0,1,2,3	ALT 7' & 11' ALT IN ROW	ALT 7' & 11' ALT IN ROW	ALT 7' & 11' ALT IN ROW	ALT 7' & 11' ALT IN ROW	ALT 7' & 11' ALT IN ROW	ALT 7' & 11' ALT IN ROW	ALT 7' & 11' ALT IN ROW	ALT 7' & 11' ALT IN ROW	ALT 6' & 10' ALT IN ROW	ALT 7' & 11' ALT IN ROW	ALT 7' & 11' ALT IN ROW	ALT 7' & 11' ALT IN ROW	ALT 7' & 11' ALT IN ROW	ALT 7' & 11' ALT IN ROW	ALT 7' & 11' ALT IN ROW	ALT 7' & 11' ALT IN ROW
	0,1,2,3,4, 6,8,10	0,1,3	0,1,2,3	0,1,2,3,4	4,5,6	0,1,2,5,4	0,1,2,3	0,1,2,3,4,5,6	0,1,2,3	0,1,2,3	0,1,2,3	0,1,2,3,4	0,1,2,3,4,5	0,1,2,3	0,1,2,3	0,1,2,4	0,1,2,4	0,1,2,4	0,1,2,3,4	0,1,2,3,4	0,1,2,3,4
	0.49	0.47	0.49	0.42	0.35	0.42	0.43	0.38	0.36	0.34	0.36	0.37	0.38	0.41	0.43	0.43	0.43	44	0.40	0.42	0.38
	0.36	0.46	0.66	0.40	0.36	0.35	0.46	0.63	0.35 GRAD 8	0.36	0.47 FINAL BACKSLOPE	0.56	0.38	0.47	49	53	0.52	0.44	0.49 FINAL BACKSLOPE	0.46	0.54
	28-42	28	28-42	28-42	28-42	28-42	28-42	28-42	42	42	42	42	42	42	42	42	42	42	42	42	42
	2.72	2.72	2.72	2.72	2.72	2.72	2.72	2.72	2.72	2.72	2.72	2.72	2.72	2.86	2.86	2.86	2.86	2.86	2.86	2.86	2.86
	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29
	1.00	1.70	0.86-1.14	0.93-1.57	1.0-1.57	1.0-1.57	1.0-1.57	1.0-1.57	0.93-1.57	1.00-1.57	1.00-1.57	1.00-1.57	1.00-1.57	0.86-1.43	1.00-1.57	1.00-1.57	1.00-1.57	1.00-1.57	1.00-1.57	1.00-1.57	1.00-1.57
	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00

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